Ravi Maths Tuition

Triangles

10th Standard

Maths

Multiple Choice Question 75 x 1 = 75

1) Given two triangles ABC and DEF ,AG and DH are perpendiculars on BC and EF respectively ∠B = ∠E , AB=5,DE=8 .What is $\frac{AG}{DH} = ?$

(a) 5/8 (b) 2/5 (c) 3/5 (d) 3/8

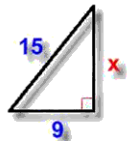
2) Which of the following cannot be the sides a right triangle?

(a) 400mm, 300 mm, 500mm (b) 9 cm, 15 cm, 12 cm (c) 2 cm, 1 cm, √5 cm (d) 9 cm, 5 cm, 7cm

3) In a triangle ABC, AC= √180 ,AB=6 ,BC=12 .What is ∠B = ?

(a) 90° (b) 30° (c) 45° (d) 60°

4) From the given figure, find the unknown x.



(a) 12 (b) 225 (c) 10 (d) 144

5) Three squares are based on the sides of a right angled triangle. The area of the two smaller ones are 144 sq. cm and 256 sq. cm. What is the area of the third one?

(a) 625 sq. cm (b) 361 sq. cm (c) 400 sq. cm (d) 900sq. cm

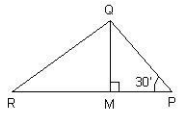
6) What is the diagonal length of a TV screen whose dimensions are 80 x 60 cm?

(a) 10 (b) 100 (c) 20 (d) 100

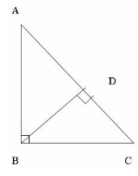
7) Which of the following is a Pythagorean triplet?

(a) (36,18,43) (b) (15,20,25) (c) (3,12,13) (d) (24,25,26)

8) QM ⊥ RP and $PR^2 - PQ^2 = OR^2$. If ∠QPM = 30° , Then ∠MQR is



(a) 45° (b) 60° (c) 90° (d) 30°

9) 

In the above figure, AB = c, BC = a, AC = b, AD = y, DB = p. Check which of the following options is correct?

(a) cy=ap (b) ac=by (c) ay=cp (d) cy=ab

10) In right triangled ABC right angled at B ,a line DE is drawn through the mid point D of AB and parallel to BC.If AB=9 cm, BC=12 cm. AE=?

(a) 13 cm (b) 10 cm (c) 8.5 cm (d) 7.5 cm

11) A boy is trying to catch fish sitting at a height of 12 m from the surface of the water.A big fish is at a horizontal distance of 5 m from him. What should be the length of his string to get the fish?

(a) 10 (b) 13 (c) 7 (d) 15

12) Triangle PQR is an isosceles right triangle right angled at Q.If PR= √50 .What is the value of each of the equal sides?

(a) 5√2 (b) 5 (c) 2 (d) 2√5

13) Three numbers form a Pythagorean triplet. Two of them are 15 and 17 where 17 is the largest of them. The third number is

(a) 8 (b) 12 (c) 13 (d) 5

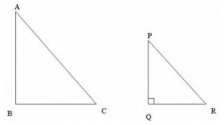
14) The length of an altitude of an equilateral triangle of side a is

(a) $\frac{a}{2\sqrt{3}}$ (b) $\frac{2a}{\sqrt{3}}$ (c) $\frac{\sqrt{3}a}{2}$ (d) $\frac{\sqrt{3}}{2a}$

15) Two friends A and B start from the same point in the Eastern and Northern directions at the same time. How far are they from each other when A has travelled 5 km and B has travelled 12 km. distance?

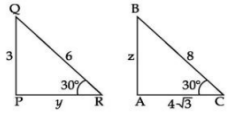
(a) 8 km (b) 17 km (c) 10 km (d) 13 km

16) Two similar right triangles ABC and PQR are as shown in the figure.If AB= √3 , PQ= √3/2, BC=1. Find PR = ?



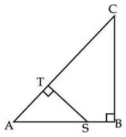
(a) 2 (b) 1 (c) 2√3 (d) 4

17) In figure, ΔABC ~ ΔPQR



(a) 2 + √3 (b) 4 + √3 (c) 3 + 4√3 (d) 4 + 3√3

18) In the given figure, T and B are right angles. If the lengths of AT, BC and AS (in centimeters) are 15, 16 and 17 respectively, then the length of TC (in centimeters) is:



(a) 18 (b) 12 (c) 19 (d) 16

19) In the given figure AD=2 cm, DB=5cm AC=21 cm and DE ll BC.Find AE =?

(a) 6 (b) 5 (c) 8 (d) 7

20) In an equilateral triangle ABC, if AD ⊥ BC. Then

(a) $3AB^2 = 4AD^2$ (b) $2AB^2 = 3AD^2$ (c) $3AB^2 = 2AD^2$ (d) $4AB^2 = 3AD^2$

21) In two triangles ABC and PQR,Given that ∠A = ∠R and ∠B = ∠Q, which of the following is true?

(a) ΔABC ~ ΔQRP (b) ΔABC ~ ΔPQR (c) ΔABC ~ ΔPRQ (d) ΔABC ~ ΔRQP

22) Triangles ABC, DEF are similar , ∠A = 75° , ∠B = 85° so ∠F =?

(a) 20° (b) 30° (c) 10° (d) 35°

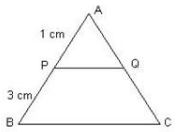
23) A vertical stick 30 m long casts a shadow 15 m long on the ground. At the same time, a tower casts a shadow 75 m long on the ground. The height of the tower is:

(a) 200 m (b) 150 m (c) 25 m (d) 100 m

24) Given two triangles ABC and PQR such that, AB = 2 cm , PQ = 3cm, ∠B = ∠Q BC = 5 cm, QR = 7.5 cm. AG and PS are medians .Find $\frac{AG}{PS}$ =?

(a) 2/5 (b) 1/5 (c) 4/5 (d) 2/3

25) In the adjoining figure, PQ||BC , the what could be the values of AQ & QC respectively



(a) 3 cm and 6 cm (b) 2 cm and 6 cm (c) 3 cm and 4 cm (d) 1 cm and 6 cm

26) In given figure, DE||BC, if AB = 7.6 cm, AD = 1.9 cm, then AE : EC is :

(a) 1:4 (b) 4:1 (c) 1:3 (d) 3:1

27) In right triangle ABC, right angled at A, A perpendicular is dropped from A to BC, meeting BC at D. Then which of the following is true?

(a) ΔADC ~ ΔABD (b) ΔDCA ~ ΔDABD (c) ΔDAC ~ ΔDABD (d) ΔDAC ~ ΔDABA

28) ΔABC ~ ΔPQR, ∠B = 50° and ∠C = 70° then ∠P is equal to

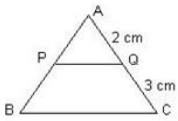
(a) 50° (b) 60° (c) 40° (d) 70°

29)  

The above two pictures of Gateway of India are:

(a) neither similar nor congruent (b) similar (c) dissimilar (d) congruent

30) In the adjoining figure, PQ || BC, then what could be the values of AP & PB respectively



(a) 1 cm and 3 cm (b) 3 cm and 6 cm (c) 2 cm and 4 cm (d) 4 cm and 6 cm

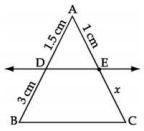
31) In triangle ABC, D and E are points on AB and AC such that DE || BC. If AD = 4x-3, AE = 8x-7, BD = 3x-1 and CE = 5x-3, find the value of x

(a) 1 (b) 1/2 (c) 1/2, -1 (d) 1, -1/2

32) Two congruent triangles are actually similar triangles with the ratio of corresponding sides as.

(a) 1:2 (b) 1:1 (c) 1:3 (d) 2:1

33) In figure, DE || BC, then x equals to :



(a) 1.4 cm (b) 2 cm (c) 4 cm (d) 2.5 cm

34) Which geometric figures are always similar?

(a) Circles (b) Circles and all regular polygons (c) Circles and triangles (d) Regular polygons

35) In ΔABC and ΔDEF, ∠B = ∠E, ∠F = ∠C and AB = 3DE then, the two triangles are

(a) congruent but not similar (b) similar but not congruent (c) neither congruent nor similar

(d) congruent as well as similar

36) If ΔABC ~ ΔDFE, ∠A = 30°, ∠C = 50°, AB = 5 cm, AC = 8cm and DF = 7.5 cm. Then, which of the following is true?

(a) DE = 12cm, ∠F = 50° (b) DE = 12cm, ∠F =100° (c) EF = 12cm, ∠*D* =100° (d) EF =12 cm, ∠D =30°

37) If in ΔABC and ΔDEF, $\frac{AB}{DF} = \frac{AC}{DE}$ then they will be similar , when

(a) ∠B =∠E (b) ∠A = ∠D (c) ∠B = ∠D (d) ∠A = ∠F

38) If ABC~QRP $\frac{ar(\triangle ABC)}{ar(\triangle PQR)} = \frac{9}{4}$,AB = 18 cm and BC = 15 cm then PR is equal to

(a) 10 cm (b) 12 cm (c) $\frac{20}{3}$ cm (d) 8 cm

39) If *S* is a point on side PQ of a ΔPQR such that PS = QS = RS, then

(a) PR. QR = RS^2 (b) $QS^2 + RS^2 = QR^2$ (c) $PP^2 + QP^2 = PQ^2$ (d) $PS^2 + RS^2 = PR^2$

40) ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is

(a) 2 :1 (b) 1 : 2 (c) 4 : 1 (d) 1 : 4

41) Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio

(a) 2 : 3 (b) 4 : 9 (c) 81 : 16 (d) 16 : 81

42) Tick the correct answer and justify : In D ABC, AB $= 6\sqrt{3}$ cm, AC = 12 cm and BC = 6 cm. The angle B is :

(a) 120° (b) 60° (c) 90° (d) 45°

43) If in two ΔABC and ΔPQR $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then

(a) Δ PQR - Δ CAB (b) Δ PQR - Δ ABC (c) Δ CBA - Δ PQR (d) Δ BCA - Δ PQR

44) It is given that, ΔABC - ΔEDF such that AB = 5 cm, AC = 7 cm, DF = 15 cm and DE = 12 cm, then the sum of the remaining sides of the triangles is

(a) 23.05 cm (b) 16.8 cm (c) 6.25 cm (d) 24 cm

45) If in ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when

(a) ∠B = ∠E (b) ∠A = ∠D (c) ∠B = ∠D (d) ∠A = ∠F

46) In Δ ABC and Δ DEF, ∠B = ∠E, ∠F = ∠C and AB = 3DE. Then, the two triangles are

(a) congruent but not similar (b) similar but not congruent (c) neithercongruent nor similar

(d) congruent as well as similar

47) If the lengths of the diagonals of rhombus are 16 cm and 12 cm. Then, the length of the sides of the rhombus is

(a) 9 cm (b) 10 cm (c) 8 cm (d) 20 cm

48) Two poles of height 6 m and 11m stand vertically upright on a plane ground. If the distance between their foot is 12 m, then distance between their tops is

(a) 12 m (b) 14 m (c) 13 m (d) 11 m

49) If Δ ABC - Δ POR with $\frac{BC}{QR} = \frac{1}{3}$ then $\frac{\text{ar}(\Delta PRQ)}{\text{ar}(\Delta BCA)}$ is equal to

(a) 9 (b) 3 (c) $\frac{1}{3}$ (d) $\frac{1}{9}$

50) Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio

(a) 2 : 3 (b) 4 : 9 (c) 81 : 16 (d) 16 : 81

51) In a right angled Δ ABC right angled at B if P and 0 are points on the sides AB and BC respectively, then

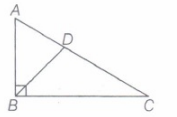
(a) $AQ^2 + CP^2 = 2(AC^2 + PQ^2)$ (b) $2(AQ^2 + CP^2) = AC^2 + PQ^2$ (c) $AQ^2 + CP^2 = AC^2 + PQ^2$

(d) $AQ + CP = \frac{1}{2}(AC + PQ)$

52) The area of a right angled triangle is 40 sq cm and its perimeter is 40 cm. The length of its hypotenuse is

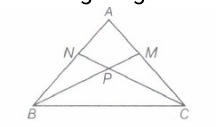
(a) 16 cm (b) 18 cm (c) 17 cm (d) data insufficient

53) In the figure given below, ∠ABC = 90°, AD = 15 cm and DC = 20 cm, If BD is the bisector of ∠ABC, What is the perimeter of the triangle ABC?



(a) 74 cm (b) 84 cm (c) 91 cm (d) 105 cm

54) In the figure givn below, AM :MC = 3 : 4, BP: PM = 3 : 2 and BN = 12 cm. Then AN equals to

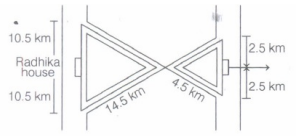


(a) 10 cm (b) 12 cm (c) 14 cm (d) 16 cm

55) Diagonal AC of a rectangle ABCD is produced to the point E such that AC : CE = 2 : 1, AB = 8 cm and BC = 6 m. The length of DE is

(a) $2\sqrt{19}$ cm (b) 15 cm (c) $3\sqrt{17}$ cm (d) 13 cm

56) Radhika wants to visit her friend who recently moved to a new house. The road map between Radhika's home and her friend's as well as the distance known to Radhika are as shown in the figure given below:



To reach the friend's house, the shortest distance which Radhika has to travel, is

(a) 30.95 km (b) 32.5 km (c) 28.5 km (d) 35.35 km

57) O is the point of intersection of the diagonals AC and BD of a trapezium ABCD with AB II DC. Through O, a line segment PQ is drawn parallel to AB meeting AD in P and BC in Q, then OP =

(a) OP = OQ (b) OP = 2 OQ (c) OQ = 2 OP (d) $OP = \frac{1}{3}OQ$

58) The area of the semi-circle drawn on the hypotenuse of a right angled triangle is equal

(a) sum of the areas of the semi-circles drawn on the other two sides of the triangle.

(b) difference of the areas of semi-circles drawn on the other two sides of the triangle

(c) product of the areas of semi-circles drown on the other two sides of the triangle (d) None of these

59) In a ΔPQR, L and Mare two points on base QR, such that L. ∠PQ = ∠QRP and ∠RPM = ∠RQP. Then, which of the following is/are true:

(i) $\Delta PQL \sim \Delta RPM$

(ii) QL x RM = PL x PM

(iii) PQ^2 = QR QL

(a) Both (i) and (ii) (b) Both (ii) and (iii) (c) Both (i) and (iii) (d) All the three

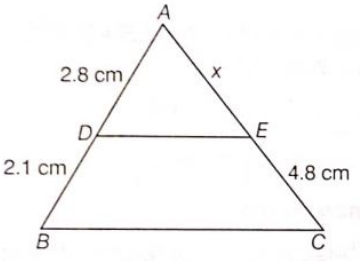
60) ΔABC is right angled atA with AB = 6 cm, BC = 10 cm. A circle with centre O has been inscribed inside the triangle. The radius of the in circle is

(a) 4 cm (b) 3 cm (c) 2 cm (d) 1 cm

61) A 5 m long ladder is placed leaning towards a vertical wall such that it reaches the wall at a point 4 m high. If the foot of the ladder is moved 1.6 m towards the wall, then the distance by which the top of the ladder would slide upwards on the wall is

(a) 0.6 cm (b) 0.2 cm (c) 0.4 cm (d) 0.8 cm

62) If in the given figure, DE || BC.
If AD = 2.8 cm, DB = 2.1 cm and EC = 4.8 cm, then the value of x is



(a) 3.6 cm (b) 2.4 cm (c) 6.4 cm (d) 4.8 cm

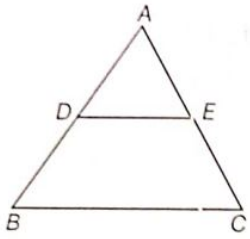
63) In a right angled Δ ABC, $\angle$ A = 90° and AB = AC. The value of sin C is

(a) 0 (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $\frac{1}{\sqrt{2}}$

64) If the diagonals of a quadrilateral divide each other proportionally, then it is a

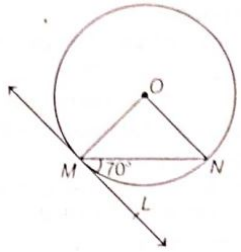
(a) parallelogram (b) rectangle (c) square (d) trapezium

65) In Δ ABC, DE || BC (as shown in the figure). If AD = 2 cm, BD = 3 cm and BC = 7.5 cm, then the length of DE (in cm) is



(a) 2.5 (b) 3 (c) 5 (d) 6

66) In the given figure, O is the centre of the circle, MN is the chord and the tangent ML at point M makes an angle of 70° with MN The measure of $\angle$ MON is

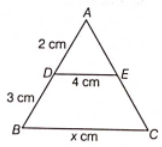


(a) 120° (b) 140° (c) 70° (d) 90°

67) ΔABC - ΔDEF and their perimeters are 32 cm and 24 cm, respectively. If AB = 10 cm, then DE equals

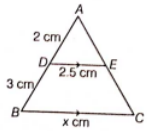
(a) 8 cm (b) 7.5 cm (c) 15 cm (d) $5\sqrt{3}$ cm

68) In the given figure, DE || BC. The value of x is



(a) 6 (b) 12.5 (c) 8 (d) 10

69) In the given figure, AD= 2cm, DB = 3 cm, DE = 2.5 cm and DE || BC. The value of x is



(a) 6 (b) 3.75 cm (c) 6.25 cm (d) 7.5 cm

70) In ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{BC}{EF}$ Which of the following makes the two triangles similar?

(a) ∠A = ∠D (b) ∠B = ∠D (c) ∠B = ∠P (d) ∠A = ∠F

71) If in ΔABC and ΔPQR, we have $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$ then

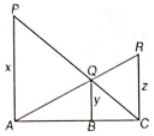
(a) $\triangle PQR \sim \triangle CAB$ (b) $\triangle PQR \sim \triangle ABC$ (c) $\triangle CBA \sim \triangle PQR$

(d) $\triangle BCA \sim \triangle PQR$

72) In two $\triangle PQR$ and $\triangle ABC$, it is given that $\frac{AB}{BC} = \frac{PQ}{PR}$. For these two triangles to be similar, which of the following should be true?

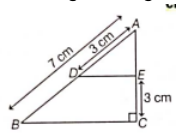
(a) ∠A = ∠P (b) ∠B = ∠Q (c) ∠B = ∠E (d) ∠A = ∠F

73) In the given figure, PA QB and RC are each perpendicular to AC. If x = 8 cm and z = 6 cm, then y is equal to



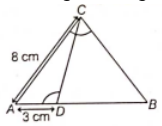
(a) 56/7 cm (b) 7/56 cm (c) 25/7 cm (d) 24/7 cm

74) In the given figure, DE || BC. If AD = 3 cm, AB = 7 cm and EC = 3 cm, then the length of AE is



(a) 2 cm (b) 2.25 cm (c) 3.5 cm (d) 4 cm

75) In the given figure, ∠ACB = ∠CDA, AC = 8 cm and AD =3 cm,then BD is



(a) 22/3 cm (b) 26/3 cm (c) 55/3 cm (d) 64/3 cm

Fill up / 1 Marks 7 x 1 = 7

76) Two triangles are similar, if their corresponding angles are ..... and

77) Two triangles are similar, if their corresponding sides are in the same .....

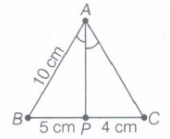
78) If a line divides any two sides of a triangle in the same ratio, then the line is ..... to the third side.

79) If the diagonals of a quadrilateral divide each other proportionally, then it is a .....

80) If the areas of two similar triangles are ..... then they are congruent.

81) Pythagoras theorem state that, in a right triangle the ..... of the hypotenuse is equal to the ..... of the squares of the other two sides.

82) In the given figure, if AP is bisector of ∠A, then length of AC is.



True or False 6 x 1 = 6

83) If corresponding. angles of two triangles are equal, then they are known as equiangular triangles.

(a) True (b) False

84) If two angles of one triangle are respectively equal to two angles of another triangle, then the two triangles are congruent.

(a) True (b) False

85) The ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides.

(a) True (b) False

86) If one angle of a triangle is equal to one angle of the other triangle and any two sides are proportional, then the two triangles are similar.

(a) True (b) False

87) The hypotenuse of a right triangles is 6 m more than the twice of the shortest side. If the third side is 2 m less than the hypotenuse, then the perimeter of the triangle is 80 cm.

(a) True (b) False

88) If two triangles are similar then the ratio of their corresponding sides is the same as the ratio of the corresponding medians.

(a) True (b) False

Match the following 4 x 1 = 4

89) In a ΔABC, DE II BC and AE : EC = 5 : 8 then AD: DB = ?	(1) 9 cm
90) If ΔABC - ΔDEF such that BC = 5 cm, EF = 4 cm and area of MBC = 100 cm^2 then area of ΔDEF is .....cm^2.	(2) 5 : 8
91) In right angled ΔABC, AC = b cm, BC = a cm, AB = 6 cm and ∠C = 90°, CD ⊥ AB and CD = 4 cm. Then, ab is ..... cm.	(3) 24
92) In ΔABC, AD is bisector of ∠A, if BD = 4 cm, DC = 6 cm and AB = 6 cm then AC is ..... cm.	(4) 64

Assertion and reason 4 x 1 = 4

93) **Assertion:** Δ ABC ~ Δ POR such that ar(ΔABC) = 36 cm^2 and ar(ΔPOR) = 49 cm^2. If AB = 6 cm, then PQ = 10 cm.

Reason: If Δ ABC - Δ DEP, then $\frac{\text{ar}(\Delta ABC)}{\text{ar}(\Delta DEF)} = \frac{AB^2}{DE^2} = \frac{BC^2}{EF^2} = \frac{AC^2}{DF^2}$

Codes:

(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

94) **Assertion:** In a rhombus of side 15 cm, one of the diagonals is 20 cm long. The length of the second diagonal is 10 $\sqrt{6}$ cm.

Reason: The sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

Codes:

(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

95) **Assertion:** In ΔABC, ∠B = 90° and BD ⊥ AC. If AD = 4 cm and CD = 5 cm then BD is $2\sqrt{5}$ cm.

Reason: The ratio of the areas of two similar triangles are equal to the ratio of squares of any two corresponding sides.

Codes:

(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

96) **Assertion:** In a quadrilateral ABCD, ∠B = 90°. If AD^2 = AB^2 + BC^2 + CD^2, then ∠ACD = 90°.

Reason: In a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angle opposite to the first side is a right angle.

Codes:

(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

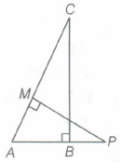
2 Marks 111 x 2 = 222

97) Fill in the blanks using the correct word given in brackets.
(i) All circles are ---------- (congruent, similar)
(ii) All squares are ---------- (similar, congruent)
(iii) All ---------- triangles are similar. (isosceles, equilateral)
(iv) Two polygons of the same number of sides are similar, if (a) their corresponding angles are ---------- and (b) their corresponding sides are ---------- (equal, proportional)

98) Give two different examples of pair of
(i) similar figures
(ii) non-similar figures

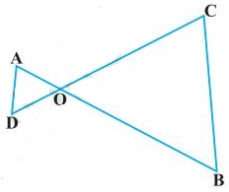
99) E and F are points on the sides PQ and PR respectively of a ΔPQR. For the following case, state whether EF || QR. PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm

100) In the given figure, ABC and AMP are two right angled triangles, right angled at B and M, respectively. Prove that $\triangle ABC \sim \triangle AMP$

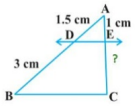


101) ABCD is a trapezium in which AB || DC and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

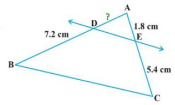
102) In the given figure, OA . OB = OC . OD. Show that ∠ A = ∠ C and ∠ B = ∠ D.



103) See the given Figure. DE || BC. Find EC



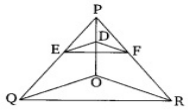
104) See the given Figure. DE || BC. Find AD



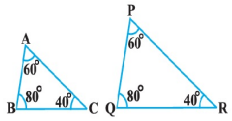
105) E and F are points on the sides PQ and PR respectively of a ΔPQR. For the following case, state whether EF || QR PE = 4 cm, QE = 4.5 cm, PF = 8 cm and RF = 9 cm

106) E and F are points on the sides PQ and PR respectively of a ΔPQR. For the following case, state whether EF || QR. PQ = 1.28 cm, PR = 2.56 cm, PE = 0.18 cm and PF = 0.36 cm

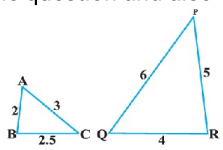
107) In the given figure, DE || OQ and DF || OR. Show that EF || QR.



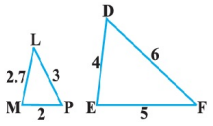
108) State which pair of triangles in the following figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:



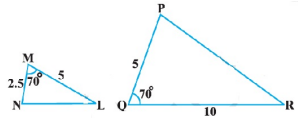
109) State which pair of triangles in the given figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:



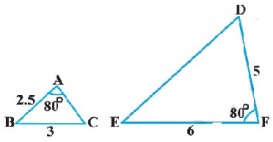
110) State which pair of triangles in the following figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:



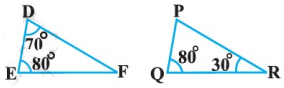
111) State which pair of triangles in the following figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:



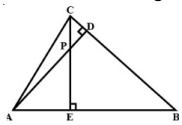
112) State which pair of triangles in the following figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:



113) State which pair of triangles in the following figure are similar? Write the similarity criterion used by you for answering the question and also write the pairs of similar triangles in the symbolic form:

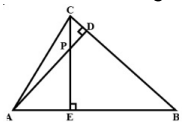


114) In the following figure, altitudes AD and CE of ΔABC intersect each other at the point P. Show that:



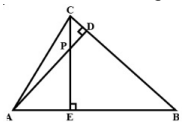
ΔAEP ~ ΔCDP

115) In the following figure, altitudes AD and CE of ΔABC intersect each other at the point P. Show that:



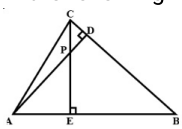
ΔABD ~ ΔCBE

116) In the following figure, altitudes AD and CE of ΔABC intersect each other at the point P. Show that:



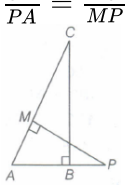
ΔAEP ~ ΔADB

117) In the following figure, altitudes AD and CE of ΔABC intersect each other at the point P. Show that:



ΔPDC ~ ΔBEC

118) In the given figure, ABC and AMP are two right angled triangles, right angled at B and M, respectively. Prove that $\frac{CA}{PA} = \frac{BC}{MP}$



119) If the areas of two similar triangles are respectively 81 cm^2 and 49 cm^2 Find the ratio of their corresponding medians.

120) If the sides of a triangle are 3 cm, 4 cm and 6 cm long, then determine whether the triangle is a right angled triangle.

121) Find the third side of a right angled triangle whose hypotenuse is of length p cm, one side of length q cm and p - q = 1.

122) Sides of triangles are given below. Determine which of them are right angled triangles? In case of a right angled triangle, write the length of its hypotenuse.
7 cm, 24 cm and 25 cm

123) The perimeters of two similar $\triangle ABC$ and $\triangle PQR$ are respectively 18 cm and 12 cm. If PQ = 5 cm, then find AB.

124) The lengths of the diagonals of a rhombus are 30 cm and 40 cm. Find the side of the rhombus.

125) Let $\triangle ABC \sim \triangle DEF$ and their areas be 64 cm^2 and 121 cm^2, respectively. If EF = 15.4 cm, find the value of BC.

126) The areas of two similar triangles are 121 cm^2 and 64 cm^2 , respectively. If the median of the first triangle is 12.1 cm, find the corresponding median of the other.

127) In $\triangle ABC$ and $\triangle DEF$, if $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{5}{9}$, find the ratio of $ar\left(\triangle ABC\right) : ar\left(\triangle DEF\right)$

128) ABC is a triangle in which $\angle A = 90^\circ$, $AN \perp BC$, BC = 12 cm and AC = 5 cm. Find the ratio of the areas of $\triangle ANC$ and $\triangle ABC$.

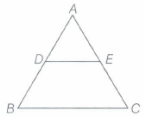
129) Is the triangle with sides 13 cm, 16 cm and 18 cm a right triangle? Give reason.

130) In a right angled triangle, if hypotenuse is 20 cm and the ratio of other two sides is 4 : 3, find the other sides.

131) A boy goes 24 m due East and 7 m due South. How far is he from the starting point?

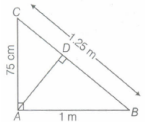
132) An equilateral triangle is inscribed in a circle of radius 6 cm. Find its side.

133) In the given figure, $DE \parallel BC$. DE = 4 cm, BC = 8 cm, area of $\triangle ADE$ = 25 sq.cm. Find the area of $\triangle ABC$



134) PQR is an equilateral triangle with each side of length 2p. If $PS \perp QR$, then find the value of PS.

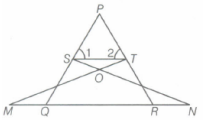
135) In the given figure, $\angle CAB = 90^\circ$, $AD \perp BC$ and $\triangle BDA \sim \triangle BAC$. If AC = 75 cm, AB = 1 m and BC = 1.25 m, then find the value of AD.



136) A vertical stick 1 m long casts a shadow 80 cm long. At the same time a tower casts a shadow 30 m long. Determine the height of the tower.

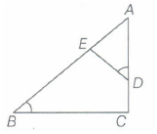
137) ABCD is a trapezium in which $AB \parallel DC$. P and Q are points on sides AD and BC respectively such that $PQ \parallel AB$. If PD = 18 cm, BQ = 35 cm and QC = 15 cm, find the value of AD.

138) In the given figure, if $\angle 1 = \angle 2$ and $\triangle NSQ \cong \triangle MTR$, prove that $\triangle PTS \sim \triangle PRQ$

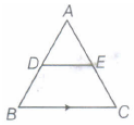


139) The diagonals of a rhombus are 30 cm and 40 cm. Find each of the rhombus.

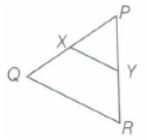
140) In $\triangle ABC$, if $\angle ADE = \angle B$, then prove that $\triangle ADE \sim \triangle ABC$. Also, if AD = 7.6 cm, AE = 7.2 cm, BE = 4.2 cm and BC = 8.4 cm, find DE.



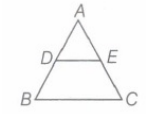
141) In $\triangle ABC, DE \parallel BC$, so that AD = (7x - 4) cm, AE = (5x - 2) cm, DB = (3x + 4) cm and EC = 3x cm. Then, find the value of x.



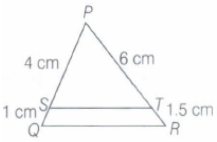
142) In the given figure, $XY \parallel QR$, PQ / XQ = 7 /3 and PR = 6.3 cm. Find the value of YR.



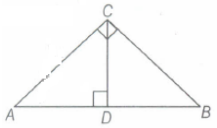
143) In $\triangle ABC$ shown below, $DE \parallel BC$. If BC = 8 cm, DE = 6 cm and area of $\triangle ADE$ = 45 cm^2, what is the area of $\triangle ABC$?



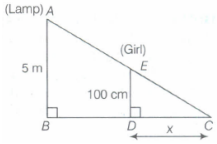
144) In the given figure, PS, SQ, PT and TR are 4 cm, 1 cm, 6 cm and 1.5 cm respectively.
Prove that $ST \parallel QR$. Also, find $\frac{ar(\triangle PST)}{ar(trapezium \quad QRTS)}$



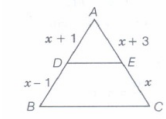
145) In the given figure, $\triangle ACB$ = 90° and $CD \perp AB$. Prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$.



146) A girl of height 100 cm is walking away from the base of a lamppost at a speed of 1.9 m/s. If the lamp is 5 m above the ground, find the length of her shadow after 4s.

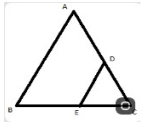


147) In △ABC, DE || BC, find the value of x.



148) In the given figure, if ∠ A=90^0, ∠ B=90^0, OB=4.5 cm, OA=6 cm and AP=4 cm, then find the QB.

149) In ABC, if X and Y are points on AB and AC respectively such that $\frac{AX}{XB} = \frac{3}{4}$, AY=5 and YC=9, then state whether XY and BC parallel or not.

150) 

In the figure of ABC, the points D and E are on the sides CA, CB respectively such that DE || AB, AD=2x, DC=x+3, B#=2x-1 and CE=x, then find the value of x.

151) Are two triangle with equal corresponding sides always similar? Two triangles having corresponding sides equal are similar.

152) If ratio of corresponding sides of two similar triangles is 5 : 6, then find ratio of their areas.

153) ABCD is a trapezium such that $\frac{AO}{OC} = \frac{BO}{OD} = \frac{1}{2}$, AB || DC and AB=3 cm. If the diagonals AC and BD intersect at O such that then calculate DC.

154) In given figure DE || BC. If AD=3 cm, DB=4 cm and AD=6 cm, then find EC.

155) In the given figure, if DE || BC, then calculate x.

156) In the figure, PQ is parallel to MN. If $\frac{K}{PM} = \frac{4}{13}$ and KN=20.4 cm, then find KQ.

157) If triangle ABC is similar to triangle DEF such that 2AB = DE and BC = 8 cm, then find EF.

158) In an equilateral triangle of side$3\sqrt{3}cm,$ find the length of the altitude.

159) In the given figure, $\triangle$ ABC ~ $\triangle$ PQR. Find the value of y + z.

160) In the given figure, OA = 3 cm, OB = 4 cm, $\angle$ AOB = 90°, AC = 12 cm and BC = 13 cm, prove that $\angle$ CAB = 90°.

161) In an equilateral triangle of side 24 cm, find the length of the altitude.

162) In $\triangle$ ABC, $AD \perp BC,$ such that AD^2=BD x CD. Prove that $\triangle$ ABC is right angles at A.

163) Find the altitude of an equilateral triangle when each of its side is 'a' cm.

164) Let $\triangle$ ABC~$\triangle$ DEF. If ar($\triangle$ ABC)=100 cm^2, ar ($\triangle$ DEF)=196 cm^2 and DE=7, then find AB.

165) In the given figure, DE || BC. If AD=1.5 cm, BD=2AD, then find $\frac{ar(\triangle ABC)}{ar(trapeziumBCED)}$.

166) In the given triangle PQR, $\angle$ OPR = 90°, PQ = 24 cm and QR = 26 cm and in PKR, $\angle$ PKR = 90° and KR = 8 cm, find PK.

167) The sides AB and AC and the perimeter P_1 of ABC are respectively three times the corresponding sides DE and DF and the perimeter P_2 of DEF, Are the two triangles similar? If yes, find $\frac{ar(\triangle ABC)}{ar(\triangle DEF)}$

168) In the given figure,$QA \perp AB$ and$PB \perp AB.$ If AO=20 cm, BO=12 cm, PB=18 cm, find AQ.

169) Given $\triangle$ ABC~$\triangle$ DEF, find $\frac{ar\triangle AB)}{ar\triangle DE)}$.

170) In the given figure, G is the mid-point of the side PQ of $\triangle$ PQR and GH || QR. Prove that H is the mid-point of the side PR of the triangle PQR.

171) In the given figure, in a triangle PQR, ST || QR and $\frac{PS}{SQ} = \frac{3}{5}$ and PR=28 cm, find PT.

172) In the given figure,$\angle$ A=$\angle$ B and AD=BE. Show that DE || AB.

173) In a rectangle ABCD, E is a point on AB such that AE=$\frac{2}{3}$ AB. If AB=6 km and AD=3 km, then find DE.

174) In the given figure, find the measure of $\angle$ X.

175) In the given figure, PQR is a triangle right angled at Q and XY || QR. If PQ=6 cm, PY=4 cm and PX : XQ=1 : 2. Calculate the lengths of PR and QR.

176) ABC is a right triangle right angled at C. Let BC=1, CA=b, AB=c and p be the length of perpendicular from C on AB. Prove that cp=ab.

177) In an equilateral triangle ABC, AD is drawn perpendicular to BC meeting BC in D. Prove that $AD^2=3BD^2$.

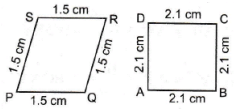
178) In the figure, PQRS is a trapezium in which PQ || RS. On PQ and RS, there are points E and F respectively such that EF intersects SQ at G. Prove the EQ x GS=GQ x FS.

179) In the given figure, if AB II DC, find the value of x.

180) In the given figure, CB II QR and CA II PR. If AQ = 12 cm, AR = 20 cm, PB = CQ = 15 cm, calculate PC and BR.

181) A man steadily goes 10m due east and then 24 m due north.
(i) Find the distance from the starting point.
(ii) Which mathematical concept is used in this problem?

182) State whether the following quadrilaterals are similar or not:



183) If ΔABC and ΔDEF are two triangles such that $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{4}{7}$. Find $\frac{area \quad \Delta ABC}{area \quad \Delta DEF}$.

184) Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.
3 cm, 8 cm and 6 cm

185) Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.
50 cm, 80 cm, 100 cm

186) Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.
13 cm, 12 cm, 5 cm

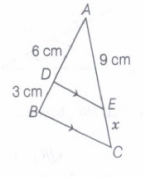
187) In Figure, ABD is a triangle right angled at A and AC ⊥ BD. Show that AB^2 = BC x BD

188) In Figure ABD is a triangle right angled at A and AC ⊥ BD. Show that AC^2 = BC x DC

189) In Figure, ABD is a triangle right angled at A and AC ⊥ BD. Show that AD^2 = BD x CD

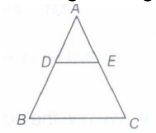
190) In an equilateral triangle ABC, D is a point on side BC such that BD $= \frac{1}{3}$ BC. Prove that 9 AD^2 = 7 AB^2

191) In the given figure, find the value of x, if DE II BC.

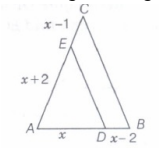


192) In $\triangle ABC$ P and Q are points on AB and AC such that $PQ \| BC$. If AP = 4 cm, AQ = 3 cm and PB = 2 cm, then find the value of AC.

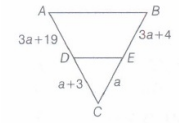
193) In the given figure, DE II BC if ADI DB = 3/5 and AG = 4.8 cm, then find the value of AE.



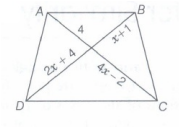
194) In the given figure, DE II BC. If AD = x, DB = x - 2, AE = x + 2 and EC = x - 1, then find the value of x.



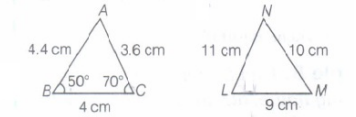
195) What value of a will make DE II AB in the figure given below?



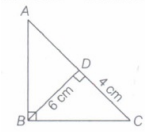
196) In the given figure, if AB IICD, then find the value of x.



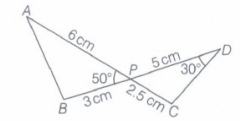
197) In the given figures, find ∠MLN.



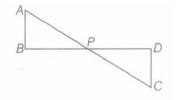
198) In the given figure $\angle ABC = 90^\circ$ and BD⊥AC. If BD = 6 cm and CD = 4cm, find the value of BC.



199) In the given figure, two line segments AC and BD intersect each other at the point P such that PA = 6 cm. PB = 3 cm, PC = 2.5 cm, PD = 5 cm $\angle APB = 50^\circ \text{ and } \angle CDP = 30^\circ.$ Then find $\angle PBA$



200) In the given figure, if $\angle A = \angle C, AB = 6$ cm BP = 15 cm, AP = 12 cm and CP = 4 cm, find the lengths of PD and CD.

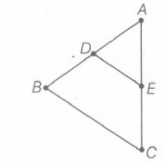


201) If two poles 5 m and 15 m high are 100 m apart, then find the height of the point of intersection of the line joining the top of each pole to the foot of the opposite pole.

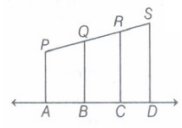
202) In $\Delta ABC, DE \| BC.$ If $DE = \frac{2}{3}$ BC and area of ΔABC = 81 cm^2, then find the area of $\Delta DAE.$

203) Given ΔABC ~ ΔPOR, if $\frac{AB}{PQ} = \frac{1}{3}$, then find $\frac{\text{ar } \Delta ABC}{\text{ar } \Delta PQR}$

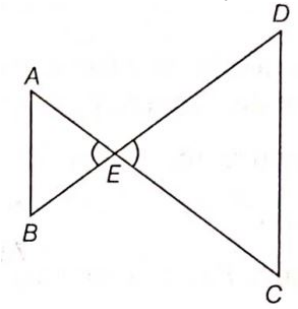
204) A park is in the form of a triangle as shown in the given figure. If we divide it into two parts: One triangle and one trapezium, taking as AD = 6 cm, AB = 15 cm, AE = 4 cm and AC = 1 cm. Area there line segment DE and BC are parallel? Justify it.



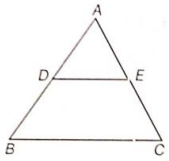
205) In the given figure PA, QB, RC and SD are all perpendiculars to a line 1, AB = 6 cm, BC = 9 cm,CD = 12 cm and SP = 36 cm. Then, find the PQ,QR and RS.



206) In the given figure, $\frac{EA}{EC} = \frac{EB}{ED}$, prove that $\triangle EAB \sim \triangle ECD$

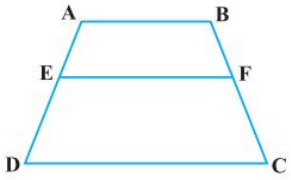


207) In the given figure, AD = 2 cm, BD = 3 cm, AE = 3.5 cm and AC = 7 cm. Is DE parallel to BC?



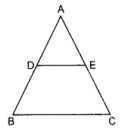
3 Marks 161 x 3 = 483

208) ABCD is a trapezium with AB || DC. E and F are points on non-parallel sides AD and BC respectively such that EF is parallel to AB. Show that $\frac{AE}{ED} = \frac{BF}{FC}$.

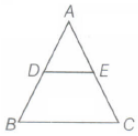


209) A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

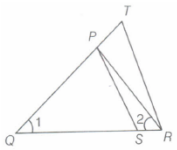
210) Using theorem (Thales theorem), prove that a line drawn through the mid-point of one side of a triangle parallel to another side, bisects the third side. (Recall that you have proved it in Class IX.)



211) Using theorem (converse of basic proportionality theorem), prove that the line joining the mid-points of any two sides of a triangle, is parallel to the third side. (Recall that you have done it in Class IX.)

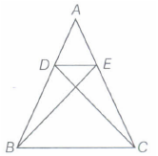


212) In the given figure, $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$. Show that $\triangle PQS \sim \triangle TQR$.



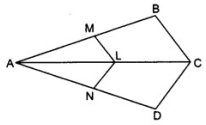
213) S and T are points on sides PR and QR of $\triangle PQR$, such that $\angle P = \angle RTS$. Show that $\triangle RPQ \sim \triangle RTS$.

214) In the given figure, if $\triangle ABE \cong \triangle ACD$, show that $\triangle ADE \sim \triangle ABC$.



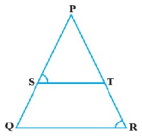
215) E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \sim \triangle CFB$.

216) In the given figure, if LM II CB and LN II CD. Prove that $\frac{AM}{AB} = \frac{AN}{AD}$.



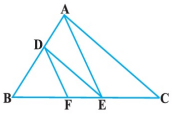
Use the basic proportionality theorem in both Δ ABC and Δ ACD

217) In the given figure, $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle$ PST =$\angle$ PRQ. Prove that PQR is an isosceles triangle.



218) If a line intersects sides AB and AC of a $\triangle$ ABC at D and E respectively and is parallel to BC, prove that $\frac{AD}{AB} = \frac{AE}{AC}$.

219) In the given figure, if DE II AC and DF II AE. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.

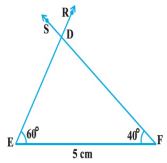


220) Draw any angle XAY and on its one arm AX, mark points (say five points) P, Q, D, R and B such that AP = PQ = QD = DR = RB.

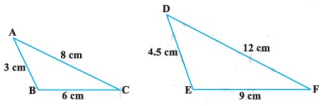
221) Draw an angle XAY on your notebook and on ray AX, mark points B_1, B_2, B_3, B_4 and B such that $AB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B$.

222) If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

223) Draw two line segments BC and EF of two different lengths, say 3 cm and 5 cm respectively. Then, at the points B and C respectively, construct angles PBC and QCB of some measures, say, 60° and 40°. Also, at the points E and F, construct angles REF and SFE of 60° and 40° respectively.

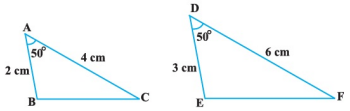


224) Draw two triangles ABC and DEF such that AB = 3 cm, BC = 6 cm, CA = 8 cm, DE = 4.5 cm, EF = 9 cm and FD = 12 cm



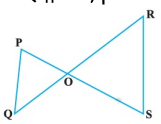
225) If in two triangles, sides of one triangle are proportional to (i.e., in the same ratio of) the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similiar.

226) Draw two triangles ABC and DEF such that AB = 2 cm, $\angle$ A = 50°, AC = 4 cm, DE = 3 cm, $\angle$ D = 50° and DF = 6 cm

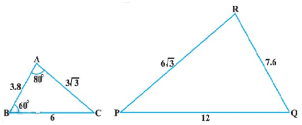


227) If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar.

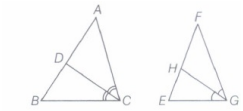
228) If PQ || RS, prove that ∠ POQ ~ ∠ SOR.



229) Observe Figure and then find ∠ P.

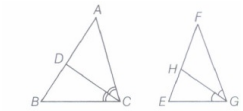


230) CD and GH are respectively the bisectors of ∠ACB and ∠EGF such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If ΔABC ~ ΔFEG, Show that



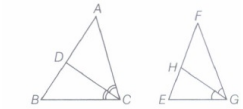
$\frac{CD}{GH} = \frac{AC}{FG}$

231) CD and GH are respectively the bisectors of ∠ACB and ∠EGF such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If ΔABC ~ ΔFEG, Show that



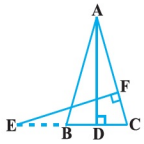
ΔDCB ~ ΔHGE

232) CD and GH are respectively the bisectors of ∠ACB and ∠EGF such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If ΔABC ~ ΔFEG, Show that

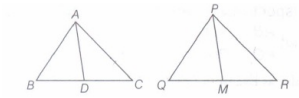


ΔDCA ~ ΔHGF

233) In the given figure, E is a point on side CB produced of an isosceles ΔABC with AB = AC. If AD ⊥ BC and EF ⊥ AC, prove that ΔABD ~ ΔECF.



234) Sides AB and BC and median AD of a ΔABC are respectively proportional to sides PQ and QR and median PM of ΔPQR. Show that ΔABC ~ ΔPQR.



235) If AD and PM are medians of ΔABC and ΔPQR, respectively where ΔABC ~ Δ PQR, prove that $\frac{\mathrm{AB}}{\mathrm{PQ}} = \frac{\mathrm{AD}}{\mathrm{PM}}$

236) Give two examples of pair of similar and non-similar figures.

237) P and Q are the points on sides AB and AC, respectively of $\triangle ABC$. If AP = 3 cm. PB = 6 cm, AQ = 5 cm and QC = 10 cm, show that BC = 3PQ.

238) A street light bulb is fixed on a pole 6 m above the level of the street. If a woman of height 1.5 m casts a shadow of 3 m, find how far is she away from the base of the pole?

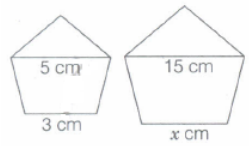
239) If the lengths of the diagonals of rhombus are 16 cm and 12 cm. Then, find the length of the sides of the rhombus.

240) For going to city B from city A, there is a route via city C such that $AC \perp CB$, AC = 2x km and CB = 2 (x + 7) km. It is proposed to construct a 26 km highway, which directly connects the two cities A and B. Find how much distance will be saved in reaching city B from city A after the construction on the highway?

241) A guy wire attached to a vertical pole of height 18 m is 24 m long and has a stake attached to the other end. How far from the base of the pole should the stake be driven so that the wire will be taut?

242) ABC is a triangle. PQ is a line segment intersecting AB at P and AC at Q such that $PQ \parallel BC$ and divides $\triangle ABC$ into two parts equal in area. Find BP / AB.

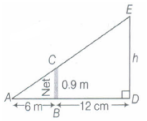
243) The given shapes are mathematically similar. Calculate the unknown side.



244) If $\triangle ABC \sim \triangle PQR$, AB = 6.5 cm, PQ = 10.4 cm and perimeter of $\triangle ABC$ = 60 cm, find the perimeter of $\triangle PQR$.

245) It is given that $\triangle ABC \sim \triangle EDF$ such that AB = 5 cm, AC = 7 cm, DF = 15 cm and DE = 12 cm. Find the lengths of the remaining sides of the triangles.

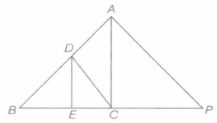
246) Find the value of the height 'h' in the adjoining figure. at which the tennis ball must be hit, so that it will just pass over the net and land 6 m away from the base of the net.



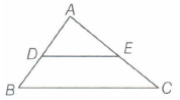
247) In $\triangle ABC$, points P and Q are on CA and CB, respectively such that CA = 16 cm, CP = 10 cm, CB = 30 cm and CQ = 25 cm. Is $PQ \parallel AB$?

248) If D and E are points on the respective sides AB and AC of $\triangle ABC$ such that AD = 6 cm. BD = 9 cm, AE = 8 cm, EC = 12 cm. Prove that $DE \parallel BC$.

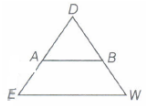
249) In the given figure of $\triangle ABC$, $DE \parallel AC$. If $DC \parallel AP$, where point P lies on BC produced, then prove that $\frac{BE}{EC} = \frac{BC}{CP}$.



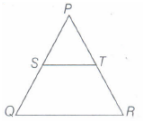
250) In the given figure, $DE \parallel BC$. If AD = 3 cm, DB = 4 cm and AE = 6 cm, find EC.



251) In $\triangle DEW, AB \parallel EW$. If AD = 4 cm, DE = 12 cm and DW = 24 cm, find the value of DB.

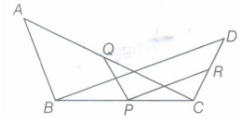


252) In $\triangle PQR, ST \parallel QR, \frac{PS}{SQ} = \frac{3}{5}$ and PR = 28 cm, find PT.

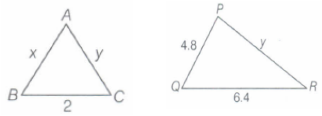


253) In $\triangle ABC$, D and E are points on the sides AB and AC respectively, such that $DE \parallel BC$. If AD = 4x - 3, AE = 8x - 7, BD = 3x - 1 and CE = 5x - 3, find the value of x.

254) In the given figure, $\triangle ABC$ and $\triangle DBC$ have same base BC and lie on the same side of BC. If $PQ \parallel BA$ and $PR \parallel BD$, then prove that $QR \parallel AD$.

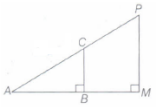


255) Find the value of unknown variables, if $\triangle ABC$ and $\triangle PQR$ are similar.

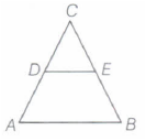


256) In $\triangle PQR$ and $\triangle MST$, $\angle P = 55^\circ$, $\angle Q = 25^\circ$, $\angle M = 100^\circ$ and $\angle S = 25^\circ$. Is $\triangle QPR \sim \triangle TSM$? Why?

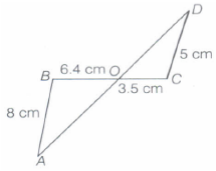
257) $\triangle ABC$ and $\triangle AMP$ are two right angled triangles. right angled at B and M, respectively. Prove that CA x MP = PA x BC



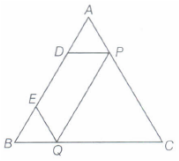
258) In the following figure, if $\frac{AD}{DC} = \frac{BE}{EC}$ and $\angle CDE = \angle CED$ then prove that $\triangle CAB$ is an isosceles triangle?



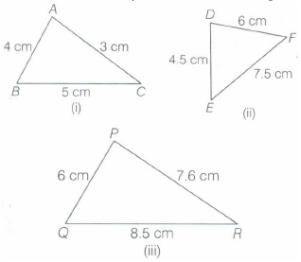
259) In the given figure, $\triangle OAB \sim \triangle OCD$. If AB = 8 cm, BO = 6.4 cm, OC = 3.5 cm and CD = 5 cm, then find the values of OA and DO.



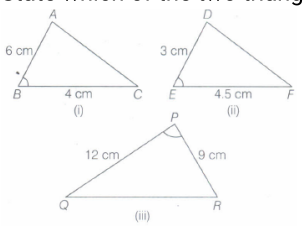
260) In the given figure, D and E are two points lying on side AB, such that AD = BE. If $DP \parallel BC$ and $EQ \parallel AC$, then prove that $PQ \parallel AB$.



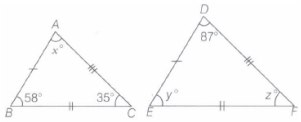
261) State which pairs of triangles in the given figure are similar? Also, state the similarity criterion used.



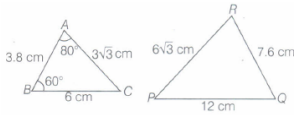
262) State which of the two triangles given in the figure are similar? Also, state the similarity criterion used.



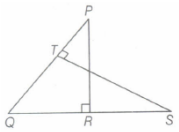
263) Find the value of each of the pronumerals in the given pair of triangles. Give reason for your answer.



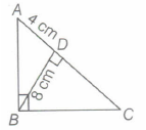
264) From the given figures, find $\angle P$.



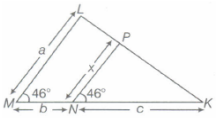
265) In the given figure, PQR and QST are two right angled triangles, right angled at R and T, respectively. Prove that QR x QS = QP x QT.



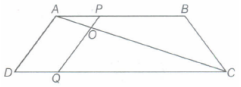
266) In the given figure, $\angle ABC$ = 90° and $BD \perp AC$. If BD = 8 cm and AD = 4 cm, then find the value of CD.



267) In the given figure, $\angle M = \angle N =$ 46°. Express x in terms of a, b and c, where a, b and c are the lengths of LM, MN and NK respectively.

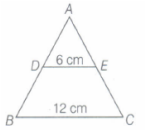


268) In the given figure, if $AB \parallel DC$ and AC, PQ intersect each other at the point O, then prove that OA. CQ = OC.AP.



269) If $\triangle ABC \sim \triangle QRP$, $\frac{ar(\triangle ABC)}{ar(\triangle QRP)} = \frac{9}{4}$, AB = 18 cm and BC = 15 cm, then find PR.

270) In the given figure, if $DE \parallel BC$, find the ratio of ar $(\triangle ADE)$ and ar $(\triangle DECB)$



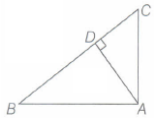
271) Diagonals of a trapezium PQRS intersect each other at the point O, $PQ \parallel RS$ and PQ = 3RS. Find the ratio of the areas of $\triangle POQ$ and $\triangle ROS$.

272) Prove that the area of the equilateral triangle described on the side of an isosceles right angled triangle is half the area of the equilateral triangle described on its hypotenuse.

273) Equilateral triangles are drawn on the sides of a right angled triangle. Show that the area of the triangle on the hypotenuse is equal to the sum of the areas of triangles on the other two sides.

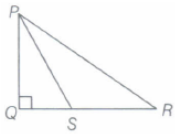
274) In an isosceles right angled triangle, if the hypotenuse is $5\sqrt{2}$ cm, then find the length of the sides of the triangle.

275) In the given figure, if $AD \perp BC$, prove that $AB^2 + CD^2 = BD^2 + AC^2$.

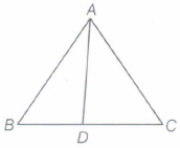


276) In $\triangle PQR, PS \perp QR$ and PS^2 = QS x RS. Prove that $\triangle PQR$ is a right angled triangle.

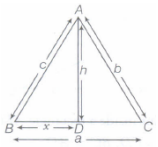
277) In the given figure, $\triangle PQR$ is a right angled triangle in which $\angle Q$ = 90°. If QS = SR, show that $PR^2 = 4\ PS^2 - 3PQ^2$.



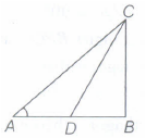
278) In the figure, $\triangle ABC$ is drawn such that $AD \perp BC$, then show that $AC^2 = AB^2 + BC^2 - 2BC.BD$.



279) In the given figure, $\angle B < 90^\circ$ and segment $AD \perp BC$. Show that $b^2 = h^2 + a^2 + x^2 - 2ax$

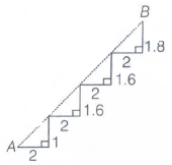


280) In the given figure, if CD = 17 m, BD = 8 m and AD = 4 m, find the value of AC.



281) Find the altitude of an equilateral triangle of side 8 cm.

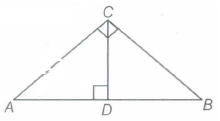
282) There is a staircase as shown in figure connecting points A and B. Measurements of steps are marked in the figure. Find the straight distance between A and B.



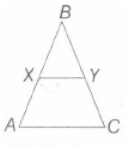
283) ABC is an isosceles triangle, right angled at C. Prove that $AB^2 = 2AC^2$.

284) ABC is an isosceles triangle with AC = BC. If $AB^2 = 2\ AC^2$, then prove that ABC is a right angled triangle.

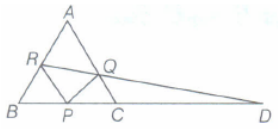
285) In the given figure, $\triangle ACB = 90^\circ$ and $CD \perp AB$. Prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$



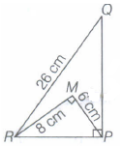
286) In the given figure, in $\triangle ABC$, $XY \parallel AC$ and XY divides the $\triangle ABC$ into two regions such that $ar\,(\triangle BXY) = 2ar\,(\triangle ACYX)$. Determine AX / AB.



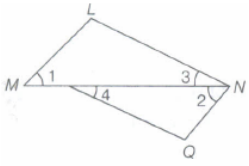
287) In the given figure, $PQ \parallel BA$ and $PR \parallel CA$. If PD = 12 cm, then find BD x CD.



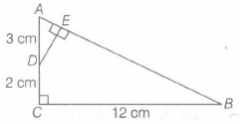
288) In the given figure, RQ = 26 cm, RM = 8 cm and PM = 6 cm. If $\angle M$ = 90°, find the area of $\triangle PQR$.



289) In figure $LM \parallel NQ$ and $LN \parallel PQ$. If MP = $\frac{1}{3}$ MN, find the ratio of the area of $\triangle LMN$ and $\triangle QNP$.

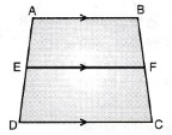


290) In the given figure, ABC is a right angled triangle, right angled at C and $DE \perp AB$.
(i) Prove that $\triangle ABC \sim \triangle ADE$
(ii) Find the lengths of AE and DE.
(iii) Find the area of ΔABC.



291) In right angled $\triangle ABC$, right angled at C, P and Q are points of sides CA and CB respectively, which divide these sides in the ratio 2 : 1. Prove that 9 AQ^2 = 9 AC^2 + 4 BC^2

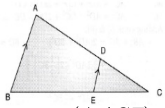
292) In the given figure, if ABCD is a trapezium in which AB || CD || EF, then prove that $\frac{AE}{ED} = \frac{BF}{FC}$.



293) In △ ABC~△ PQR and AD and PS are bisectors of corresponding angles A and P, then prove that $\frac{ar(\triangle ABC)}{ar(\triangle PQR)} = \frac{AD^2}{AS^2}$.

294) State whether the given pairs of triangle are similar or not. In case of similarity mention the criterion.

295) In given figure, D is a point on AC such that AD = 2CD, also DE II AB.



Find: $\frac{ar(\triangle ACF)}{ar(\triangle BCE)}$

296) From an airport, two aeroplanes start at the same time. If speed of first aeroplane due North is 500 km/h and that of other due East is 650 km/h then find the distance between the two aeroplanes after 2 hours.

297) Prove that area of the equilateral triangle described on the side of a square is half of the area of the equilateral triangle described on its diagonal.

298) In a trapezium ABCD, diagonals AC and BD intersect at O. If AB = 3CD, then find ratio of areas of triangles COD and AOB.

299) △ ABC is right angled at e. If p is the length of the perpendicular from C to AB and a, b, care the lengths of the sides opposite ∠ A, ∠ B and ∠ C respectively, then prove that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

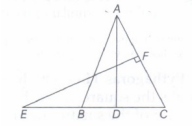
300) In MBC, DE II Be. If AD = x + 2, DB = 3x + 16, AE = x and EC = 3x + 5, then find x.

301) If in △ ABC, AD is median and AE ⊥ BC, then prove that $AB^2 + AC^2 = 2AD^2 + \frac{1}{2} BC^2$.

302) ABC is a triangle, PQ is the line segment intersecting AB in P and AC in Q such that PQ II BC and divides △ ABC into two parts, equal in area, find BP : AB.

303) In the given figure, PQ II BA and PR II CA. If PD = 12 cm, find BD x CD.

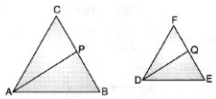
304) In the given figure, ABC is a right angled triangle, $\angle$ B = 90°. D is the mid-point of BC. Show that $AC^2 = AD^2 + 3CD^2$.



305) If the diagonals of a quadrilateral divide each other proportionally, prove that it is a trapezium.

306) In the given figure, P and Q are the points on the sides AB and AC respectively of $\triangle$ ABC, such that AP = 3.5 em, PB = 7 em, AQ = 3 cm and QC = 6 cm. If PQ = 4.5 cm, find BC.

307) In given figure $\triangle$ ABC ~ $\triangle$ DEF . AP bisects $\angle$ CAB and DQ bisects $\angle$ FDE.



(i) $\frac{AP}{DQ} = \frac{AB}{DE}$

(ii) $\triangle$ CAP~$\triangle$ FDQ.

308) In the given figure, DB$\perp$ BC, DE$\perp$ AB and AC$\perp$ BC Prove that $\frac{BE}{DE} = \frac{AC}{BC}$.

309) In the given figure, DE II AB and FE II DB. Prove that DC2 = CF x AC.

310) In the given figure, $\triangle$ ABC and $\triangle$ DBC are on the same base BC AD and BC intersect at O. Prove that $\frac{ar(\triangle ABC)}{ar(\triangle DBC)} = \frac{AO}{DO}$.

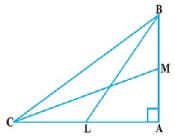
311) In the given figure, two triangles ABC and DBC lie on the same side of BC such that PQ II BA and PR II BD. Prove that QR II AD.

312) The perpendicular AD on the base BC of a $\triangle$ ABC intersects BC at D so that DB = 3CD. Prove that $2(AB)^2 = 2(AC)^2 + BC^2$.

313) In the given figure, $\frac{PA}{AQ} = \frac{PB}{BR} = 3.$ If the area of $\triangle$ PQR is 32 cm^2, then find the area of the quadrilateral AQRB.

314) Prove that the sum of squares on the sides of a rhombus is equal to sum of squares of its diagonals.

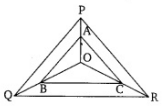
315) In the given figure, BL and CM are medians of $\triangle$ ABC, right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.



316) In a $\triangle$ ABC, let P and Q be points on AB and AC respectively such that PQ II BC. Prove that the median AD bisects PQ.

317) The diagonals of a trapezium ABCD, in which AB II DC, intersect at O. If AB = 2CD, then find the ratio of areas of triangles AOB and COD.

318) In the given figure A, B and Care points on OP, OQ and OR respectively such that AB II PQ and AC II PR. Prove that BC II QR.



319) In the given figure, find the value of x in terms of a, b and c.

320) In the given figure, BC II PQ and BC = 8 cm, PQ = 4 cm, BA = 6.5 cm, AP =2.8 cm. Find CA and AQ.

321) In the given figure, if AD$\perp$ BC, prove that $AB^2 + CD^2 = BD^2 + AC^2$.

322) In the given figure, CD II LA and DE II AC Find the length of CL, if BE = 4 cm and EC = 2 cm.

323) In the given figure, AB = AC E is a point on CB produced. If AD is perpendicular to BC and EF perpendicular to AC Prove that $\triangle$ ABD is similar to $\triangle$ CEF.

324) In the given figure, AD⊥ BC and BD =$\frac{1}{3}$ CD. Prove that $2AC^2 = 2AB^2 + BC^2$.

325) If ABC is an obtuse angled triangle, obtuse angled at B and if AD ⊥ CB. Prove that:
$AC^2 = AB^2 + BC^2 + 2BC \times BD$

326) ABC is a right-angled triangle, right-angled at A. A circle is inscribed in it. The lengths of the two sides containing the right angle are 6 cm and 8 cm. Find the radius of the incircle.

327) In a right triangle ABC, right angled at C, P and Q are points of the sides CA and CB respectively, which divide these sides in the ratio 2 : 1.
Prove that : $9AQ^2 = 9AC^2 + 4BC^2$
$9BP^2 = 9BC^2 + 4AC^2$
$9(AQ^2 + BP^2) = 13AB^2$.

328) Find the length of the second diagonal of a rhombus, whose side is 5 cm and one of the diagonals is 6 cm.

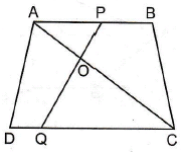
329) Prove that three times the sum of the squares of the sides of a triangle is equal to four times the sum of the squares of the medians of the triangle.

330) ABC is an isosceles triangle in which AB = AC = 10 cm. BC =l2cm. PQRS is a rectangle inside the isosceles triangle. Given PQ = SR = y em, PS = QR =2x. Prove that x =6-$\frac{3y}{4}$.

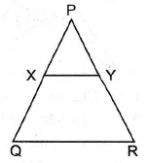
331) If A be the area of a right triangle and b be one of the sides containing the right angle, prove that the length of the altitude on the hypotenuse is $\frac{2Ab}{\sqrt{b^4+4A^2}}$

332) D is the mid-point of side BC of ΔABC and E is the mid-point of AD. BE produced meets AC at the point M. Prove that BE = 3EM

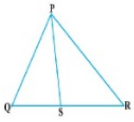
333) In fig. if AB ll DC and AC and PQ intersect each other at the point O, prove that OA. CQ = OC⊥AP



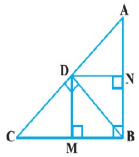
334) In the given figure, ΔPQR in which XY ll QR, PX = 1 cm, XQ = 3 cm, YR = 4.5 cm, QR = 9 cm, find PY and XY. Further if the area of ΔPXY, is cm^2 , find in terms of A, the area of ΔPQR and : 33 of trapezium XYRQ.



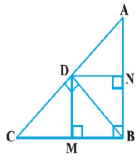
335) In the given figure, PS is the bisector of ∠QPR of ΔPQR. Prove that $\frac{QS}{SR} = \frac{PQ}{PR}$



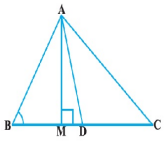
336) In the given figure, D is a point on hypotenuse AC of ΔABC, DM ⊥ BC and DN ⊥ AB, Prove that:
$DM^2 = DN.MC$



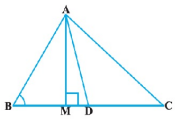
337) In the given figure, D is a point on hypotenuse AC of ΔABC, DM ⊥ BC and DN ⊥ AB, Prove that:
$DN^2 = DM . AN$



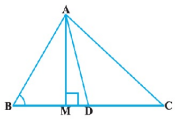
338) In the given figure, AD is a median of a triangle ABC and AM ⊥ BC. Prove that:
$AC^2 = AD^2 + BC.DM + \left(\frac{BC}{2}\right)^2$



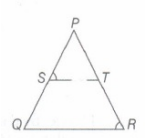
339) In the given figure, AD is a median of a triangle ABC and AM ⊥ BC. Prove that:
$AB^2 = AD^2 - BC.DM + \left(\frac{BC}{2}\right)^2$



340) In the given figure, AD is a median of a triangle ABC and AM ⊥ BC. Prove that:
$AC^2 + AB^2 = 2AD^2 + \frac{1}{2}(BC)^2$

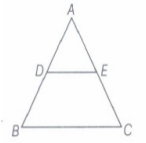


341) In the adjoining figure $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that PQRis an isosceles triangle.



342) Prove that, if three or more parallel lines are intersected by two transversals, then intercepts made by them on the transversal are proportional.

343) In figure, $DE \| BC$ AD = 1cm and BD = 2 cm. What is the ratio of the ar (MBC) to the ar (ΔADE)?



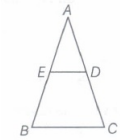
344) The areas of two similar triangles are respectively 25 cm^2 and 81 cm^2. Find the ratio of their corresponding sides.

345) ΔABC and ΔDEF are similar. Area of ΔDEF is 9 cm^2 and area of 8DEF is 64 cm^2. If DE = 5.1cm, then find the value of AB.

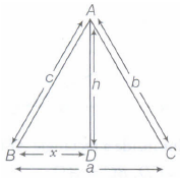
346) ΔABC and ΔDEF are-similar and AB $= \frac{1}{3}DE$ then find ar (ΔABC) : ar (ΔDEF)

347) In $\Delta ABC, PQ \| AC$ and PQ divides triangular region ABG into two parts such that ar (BPQ) $= \frac{1}{4}$ar (PQCA). Find BP : PA.

348) In the given figure, ΔAED and trapezium EBCD are such that the area of trapezium is three times the area of the triangle. Find the ratio $\frac{AE}{AB}$.



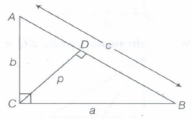
349) In the given figure, $\angle B < 90^\circ$ and segment $AD \perp BC$. Show that
$b^2 = h^2 + a^2 + x^2 - 2ax$



350) Two isosceles triangles have equal vertical angles and their areas are in the ratio 36 : 25. Find the ratio of their corresponding heights.

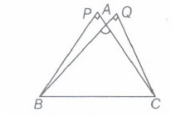
351) In an isosceles triangle ABC, if AB = AC = 25 cm and altitude from A on Be is 24 cm, then find BC.

352) $\triangle ABC$ is a right triangle in which $\angle C =$ 90° and $CD \perp AB$. If BC = a, CA = b, AB = C and CD = p, then prove that
$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

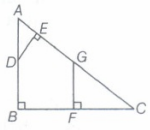


353) Two students of class X, discuss on criteria for similarity of triangles. First student explain SSS similarity criterion as in ΔABC and ΔDEF such that $\angle A = \angle D$ and $\frac{AB}{DE} = \frac{AC}{DF}$, at once second student said, "It is wrong". If do you agree with second student, give correct explanation.

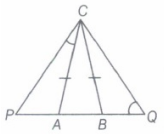
354) In ΔABC, ∠A is obtuse, PB⊥PC and QC⊥QB. Prove that AB x AQ = AC x AP.



355) In the given figure, if AB ⊥ BC, DE ⊥ AC and GF ⊥ BC, then prove that $\triangle ADE \sim \Delta GCF$.

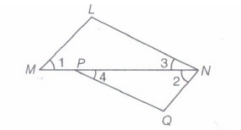


356) In given figure, ABC is an isosceles triangle with AC = BC. AB is produced on either side till P and Q respectively such that AP x BQ = AC^2 Prove that ∠PCA = ∠CQB.



357) PB and QA are the perpendiculars to segment AB. If PO = 5 cm, QO = 7 cm and ar (ΔBOP) = 150 cm^2, find ar (ΔQOA)

358) In the given figure LM II NQ and LN II PQ If MP = $\frac{1}{3}$ MN, find the ratio of the area of ΔLMN and ΔQNP



359) A farmer has a field in the shape of a rightangled triangle with legs (sides other than the hypotenuse) are of lengths 16 m and 8 m. She wants to leave a space in the form of a square of largest area for growing wheat and remaining area for growing vegetables.
(i) Find the length of the side of such a square.
(ii) Find the area of the square.

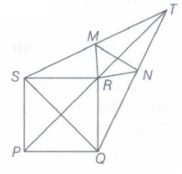
360) In ΔABC, ∠BCA = 90°, Q is the mid-point of BC, prove that $(AB)^2 = 4AQ^2 - 3AC^2$.

361) In a ΔPQR, $PR^2 - PQ^2 = QR^2$ and M is a point on side PR such that QM ⊥ PR. Prove that QM^2 = PM x MR.

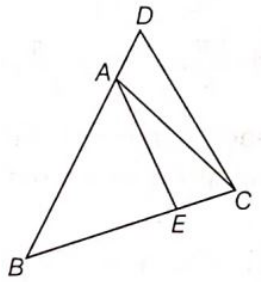
362) In a quadrilateral ABCD, ∠A + ∠D = 90°.
Prove that $AC^2 + BD^2 = AD^2 + BC^2$.

363) If S is a point on side PQ of a ΔPQR such that PS = QS = RS, prove that $PR^2 + QR^2 = pQ^2$.

364) In the given figure, T is the exterior point on the diagonal PR of a parallelogram PQRS. SR produced meets OT at N and QR produced meets ST at M. Prove that MN II SQ.

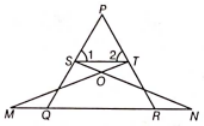


365) In the given figure, $\angle ABC = \angle ACB$ and $\frac{BC}{BE} = \frac{BD}{AC}$

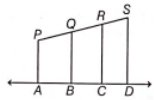


Show that $\triangle ABE \sim \triangle DBC$ and AE || DC.

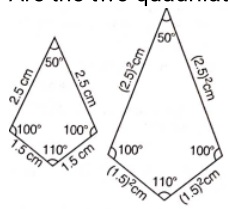
366) In the given figure, if ∠1 = ∠2 and ΔNSQ = ΔMTR, prove that ΔPTS ~ ΔPRQ.



367) In the given figure PA, QB,RC and SD are all perpendiculars to a line , AB = 6 cm, BC = 9 cm, CD = 12 cm and SP = 36 cm. Then, find the PQ, QR and RS.



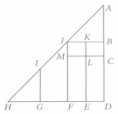
368) Are the two quadrilaterals shown below similar? Give a reason for your answer



Case Study Questions 24 x 4 = 96

369) In a classroom, students were playing with some pieces of cardboard as shown below.

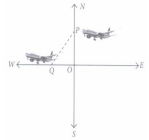
All of a sudden, teacher entered into classroom. She told students to arrange all pieces. On seeing this beautiful image, she observed that Δ ADH is right angled triangle, which contains.



(i) right triangles ABJ and IGH.
(ii) quadrilateral GFJI
(iii) squares JKLM and LCBK
(iv) rectangles MLEF and LCDE.
After observation, she ask certain questions to students. Help them to answer these questions.
(i) If an insect (small ant) walks 24 m from H to F, then walks 6 m to reach at M, then walks 4 m to reach at L and finally crossing K, reached at J. Find the distance between initial and final position of insect.
(a) 25m (b) 26m (c) 27m (d) 28m
(ii) If m, n and r are the sides of right triangle ABJ, then which of the following can be correct?
(a) $m^2+n^2= r^2$ (b) $m^2+n^2+r^2-=0$
(c) $m^2 + n^2 = 2r^2$ (d) none of these
(iii) If Δ ABJ ~ Δ ADH, then which similarity criterion is used here?
(a) AA (b) SAS (c) AAS (d) SSS
(iv) If $\angle$ ABJ = 90° and B, J are mid points of sides AD and AH respectively and BJ || DH, then which of the following option is false?
$(a)\triangle ABJ \sim \triangle ADH \quad (b)2BJ = DH \quad (c)AJ^2 = JB^2 + AB^2 \quad (d)\frac{AB}{BD} = \frac{AJ}{AH}$
(v) If Δ PQR is right triangle with QM $\perp$ PR, then which of the following is not correct?

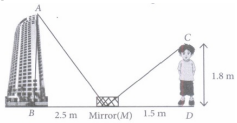
$(a)\Delta PMQ \sim \Delta PQR$
$(b)QR^2 = PR^2 - PQ^2$
$(c)PR^2 = PQ + QR$
$(d)\Delta PMQ \sim \Delta QMR$

370) An aeroplane leaves an airport and flies due north at a speed of 1200km /hr. At the same time, another aeroplane leaves the same station and flies due west at the speed of 1500 km/hr as shown below. After $1\frac{1}{2}$ hr both the aeroplanes reaches at point P and Q respectively.



(i) Distance travelled by aeroplane towards north after $1\frac{1}{2}$ hr is
(a) 1800 km (b) 1500 km (c) 1400km (d) 1350 km
(ii) Distance travelled by aeroplane towards west after $1\frac{1}{2}$ hr is
(a) 1600 km (b) 1800 km (c) 2250km (d) 2400 km
(iii) In the given figure,$\angle$ POQ is
(a) 70° (b) 90° (c) 80° (d) 100°
(iv) Distance between aeroplanes after $1\frac{1}{2}$ hr is
$(a)450\sqrt{41}\text{ km} \quad (b)350\sqrt{31}\text{ km} \quad (c)125\sqrt{12}\text{ km} \quad (d)472\sqrt{41}\text{ km}$
(v) Area of Δ POQ is
(a) 185000km^2 (b) 179000km^2
(c) 186000km^2 (d) 2025000 km^2

371) Rohit's father is a mathematician. One day he gave Rohit an activity to measure the height of building. Rohit accepted the challenge and placed a mirror on ground level to determine the height of building. He is standing at a certain distance so that he can see the top of the building reflected from mirror. Rohit eye level is at 1.8m above ground. The distance of Rohit from mirror and that of building from mirror are 1.5 m and 2.5 m respectively.



Based on the above information, answer the following questions.

(i) Two similar triangles formed in the above figure is

$(a)\Delta ABMand\Delta CMD$ $(b)\Delta AMBand\Delta CDM$ $(c)\Delta ABMand\Delta CDM$ **(d) None of these**

(ii) Which criterion of similarity is applied here?

(a) AA similarity criterion (b) SSS similarity criterion

(c) SAS similarity criterion (d) ASA similarity criterion

(iii) Height of the building is

(a) 1m (b) 2m (c) 3m (d) 4m

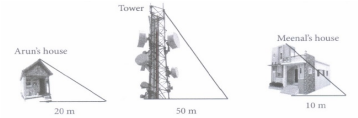
(iv) In Δ ABM, if LBAM = 30°, then LMCD is equal to

(a) 40° (b) 30° (c) 65° (d) 90°

(v) If Δ ABM and Δ CDMare similar where CD = 6 ern, MD = 8 cm and BM = 24 ern, then AB is equal to

(a) 16cm (b) 18cm (c) 12cm (d) 14cm

372) Meenal was trying to find the height of tower near his house. She is using the properties of similar triangles. The height of Meenal's house is 20 m. When Meenal's house casts a shadow of 10m long on the ground, at the same time, tower casts a shadow of 50 m long and Arun's house casts a shadow of 20 m long on the ground as shown below.



Based on the above information, answer the following questions.

(i) What is the height of tower?

(a) 100 m (b) 50 m (c) 15 m (d) 45 m

(ii) What will be the length of shadow of tower when Meenal's house casts a shadow of 15 m?

(a) 45 m (b) 70 m (c) 75 m (d) 72 m

(iii) Height of Aruns house is

(a) 80 m (b) 75 m (c) 60 m (d) 40 m

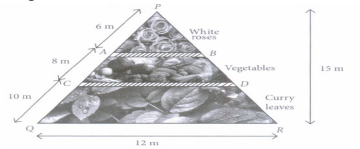
(iv) If tower casts a shadow of 40 rn, then find the length of shadow of Arun's house

(a) 18 m (b) 17 m (c) 16 m (d) 14 m

(v) If tower casts a shadow of 40 m, then what will be the length of shadow of Meenal's house?

(a) 7 m (b) 9 m (c) 4 m (d) 8 m

373) In the backyard of house, Shikha has some empty space in the shape of a Δ PQR. She decided to make it a garden. She divided the whole space into three parts by making boundaries AB and CD using bricks to grow flowers and vegetables where ABIICDIIQR as shown in figure.



Based on the above information, answer the following questions.

(i) The length of AB is

(a) 3m (b) 4m (c) 5m (d) 6m

(ii) The length of CD is

(a) 4m (b) 5m (c) 6m (d) 7m

(iii) Area of whole empty land is

(a) 90 m^2 (b) $60m^2$ (c) $32m^2$ (d) $72m^2$

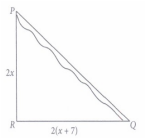
(iv) Area of Δ PAB is

$(a)\frac{45}{4}\ \mathrm{m}^2 \quad (b)\frac{45}{8}\ \mathrm{m}^2 \quad (c)\frac{8}{45}\ \mathrm{m}^2 \quad (d)\frac{4}{45}\ \mathrm{m}^2$

(v) Area of Δ PCD is

$(a)\frac{12}{245}\ \mathrm{m}^2 \quad (b)\frac{245}{12}\ \mathrm{m}^2 \quad (c)\frac{243}{8}\ \mathrm{m}^2 \quad (d)\frac{245}{8}\ \mathrm{m}^2$

374) Minister of a state went to city Q from city P. There is a route via city R such that PR $\perp$ RQ. PR = 2x km and RQ = 2(x + 7) km. He noticed that there is a proposal to construct a 26 km highway which directly connects the two cities P and Q.



Based on the above information, answer the following questions.

(i) Which concept can be used to get the value of x?

(a) Thales theorem (b) Pythagoras theorem
(c) Converse ofthales theorem (d) Converse of Pythagoras theorem

(ii) The value of x is

(a) 4 (b) 6 (c) 5 (d) 8

(iii) The value of PR is

(a) 10 km (b) 20 km (c) 15 km (d) 25 km

(iv) The value of RQ is

(a) 12 km (b) 24 km (c) 16 km (d) 20 km

(v) How much distance will be saved in reaching city Q after the construction of highway?

(a) 10 km (b) 9 km (c) 4 km (d) 8 km

375) Class teacher draw the shape of quadrilateral on board. Ankit observed the shape and explored on his notebook in different ways as shown below.

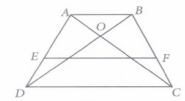


Fig. 1

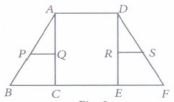


Fig. 2

Based on the above information, answer the following questions.

(i) In if ABCD is a trapezium with AB || CD, E and F are points on non-parallel sides AD and BC respectively such that EF || AB, then $\frac{AE}{ED} =$

(a) $\frac{BE}{CD}$ **(b)** $\frac{AB}{CD}$ **(c)** $\frac{BF}{FC}$ **(d) None of these**

(ii) In if AB || CD, and DO = 3x - 19, OB = x - 5, OC = x - 3 and AO = 3, then the value of x can be

(a) 5 or 8 **(b) 8 or 9** **(c) 10 or 12** **(d) 13 or 14**

(iii) In if OD = 3x - 1, OB = 5x - 3, OC = 2x + 1 and AO = 6x - 5, then the value of x is

(a) 0 **(b) 1** **(c) 2** **(d) 3**

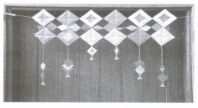
(iv) In Δ ABC, if PQ || BC and AP = 2.4 cm, AQ = 2 cm, QC = 3 cm and BC = 6 cm, then AB + PQ is equal to

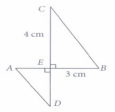
(a) 7.2 cm **(b) 5.9 cm** **(c) 2.6 cm** **(d) 8.4 cm**

(v) In Δ DEF, if RS || EF, DR = 4x - 3, DS = 8x - 7, ER = 3x - 1 and FS = 5x - 3, then the value of x is

(a) 1 **(b) 5.9 cm** **(c) 2.6 cm** **(d) 8.4 cm**

376) Ankita wants to make a toran for Diwali using some pieces of cardboard. She cut some cardboard pieces as shown below. If perimeter of Δ ADE and Δ BCE are in the ratio 2: 3, then answer the following questions.





(i) If the two triangles here are similar by SAS similarity rule, then their corresponding proportional sides are

$(a)\frac{AE}{CE} = \frac{DE}{BE}$ $(b)\frac{BE}{AE} = \frac{CE}{DE}$ $(c)\ \frac{AD}{CE} = \frac{BE}{DE}$ **(d) None of these**

(ii) Length of BC =

(a) 2 cm **(b) 4 cm** **(c) 5 cm** **(d) None of these**

(iii) Length of AD =

(a) 10/3 cm **(b) 9/4 cm** **(c) 5/3 cm** **(d) 4/3 cm**

(iv) Length of ED =

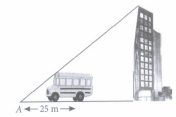
(a) 4/3 cm **(b) 8/3 cm** **(c) 7/3 cm** **(d) None of these**

(v) Length of AE =

$(a)\frac{2}{3} \times BE$ $(b)\sqrt{AD^2 - DE^2}$ $(c)\frac{2}{3} \times \sqrt{BC^2 - CE^2}$ **(d) All of these**

377) Aruna visited to her uncle's house. From a point A, where Aruna was standing, a bus and building come in a straight line as shown in the figure.

Based on the above information, answer the following questions.



(i) Which similarity criteria can be seen in this case, if bus and building are considered in a straight line?

(a) AA (b) SAS (c) SSS (d) ASA

(ii) If the distance between Aruna and the bus is twice as much as the height of the bus, then the height of the bus is

(a) 40 m (b) 12.5 m (c) 15 m (d) 20 m

(iii) If the distance of Aruna from the building is twelve times the height of the bus, then the ratio of the heights of bus and building is

(a) 3:1 (b) 1:4 (c) 1:6 (d) 2:3

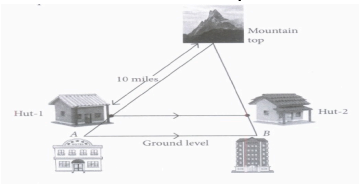
(iv) What is the ratio of the distance between Aruna and top of bus to the distance between the tops of bus and building?

(a) 1:5 (b) 1:6 (c) 2:5 (d) Can't be determined

(v). What is the height of the building?

(a) 50 m (b) 75 m (c) 120 m (d) 30 m

378) Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut-2 and that ofhut-2 to mountain top is 3: 7.



Based on the above information, answer the following questions.

(i) What is the ratio of the perimeters of the triangle formed by both hotels and mountain top to the triangle formed by both huts and mountain top?

(a) 5: 2 (b) 10: 7 (c) 7: 3 (d) 3: 10

(ii) The distance between the hotel A and hut-I is

(a) 2.5 miles (b) 29 miles (c) 4.29 miles (d) 1.5 miles

(iii) If the horizontal distance between the hut -1 and hut -2 is 8 miles, then the distance between the two hotels is

(a) 2.4 miles (b) 11.43 miles (c) 9 miles (d) 7 miles

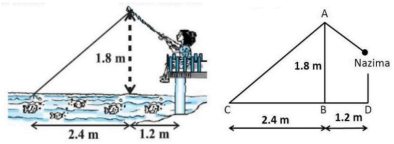
(iv) If the distance from mountain top to hut-1 is 5 miles more than that of distance from hotel B to mountain top, then what is the distance between hut-2 and mountain top?

(a) 3.5 miles (b) 6 miles (c) 5.5 miles (d) 4 miles

(v) What is the ratio of areas of two parts formed in the complete figure?

(a) 53: 21 (b) 10: 41 (c) 51: 33 (d) 49:51

379) Nazima is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. She is pulling the string at the rate of 5 cm per second. Nazima's friend observe her position and draw a rough sketch by using A, B, C and D positions of tip, point directly under the tip of the rod, fish and Nazima's position (see the below figure). Assuming that her string (from the tip of her rod to the fly) is taut, answer the following questions:



(a) What is the length AC?

(a) 2 m (b) 3 m (c) 4 m (d) 5 m

(b) What is the length of string pulled in 12 seconds?

(a) 6 m (b) 0.3 m (c) 0.6 m (d) 3 m

(c) What is the length of string after 12 seconds?

(a) 2.4 m (b) 2.7 m (c) 2 m (d) 2.2 m

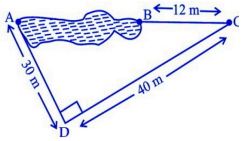
(d) What will be the horizontal distance of the fly from her after 12 seconds?

(a) 2.7 m (b) 2.78 m (c) 2.58 m (d) 2.2 m

(e) The given problem is based on which concept?

(a) Triangles (b) Co-ordinate geometry (c) Height and Distance (d) None of these

380) Points A and B are on the opposite edges of a pond as shown in below figure. To find the distance between the two points, Ram makes a right-angled triangle using rope connecting B with another point C at a distance of 12 m, connecting C to point D at a distance of 40 m from point C and then connecting D to the point A which is at a distance of 30 m from D such that $\angle ADC = 90^0$.



(i) Which property of geometry will be used to find the distance AC?

(a) Similarity of Triangles (b) Thales Theorem (c) Pythagoras Theorem (d) Quadratic Equation

(ii) What is the distance AC?

(a) 50m (b) 12m (c) 100m (d) 70m

(iii) Which is the following does not form a Pythagoras triplet?

(a) (7, 24, 25) (b) (15, 8, 17) (c) (5, 12, 13) (d) (21, 20, 28)

(iv) Find the length AB.

(a) 12m (b) 38m (c) 50m (d) none of these

(v) Find the length of the rope used.

(a) 120m (b) 70m (c) 82m (d) none of these

381) Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure.

(i) Rahul tied the sticks at what angles to each other?

(a) 30° (b) 60° (c) 90° (d) 60°

(ii) Which is the correct similarity criteria applicable for smaller triangles at the upper part of this kite?

(a) RHS (b) SAS (c) SSA (d) AAS

(iii) Sides of two similar triangles are in the ratio 4:9. Corresponding medians of these triangles are in the ratio,

(a) 2:3 (b) 4:9 (c) 81:16 (d) 16:81

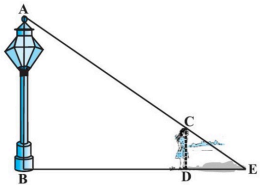
(iv) In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle. This theorem is called as,

(a) Pythagoras theorem (b) Thales theorem (c) Converse of Thales theorem (d) Converse of Pythagoras theorem

(v) What is the area of the kite, formed by two perpendicular sticks of length 6 cm and 8 cm?

(a) 48 cm^2 (b) 14 cm^2 (c) 24 cm^2 (d) 96 cm^2

382) On one day, a poor girl of height 90 cm is looking for a lamp-post for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp is 3.6 m above the ground (see below figure).



(i) Find her distance from the base of the lamp post.

(a) 1.2 m (b) 3.6 m (c) 4.8 m (d) none of these

(ii) Find the correct similarity criteria applicable for triangles ABE and CDE.

(a) AA (b) SAS (c) SSS (d) AAS

(iii) Find the length of her shadow after 4 seconds.

(a) 1.2 m (b) 3.6 m (c) 4.8 m (d) none of these

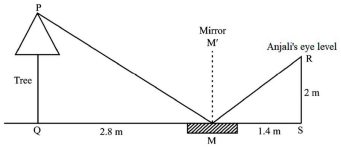
(iv) Sides of two similar triangles are in the ratio 9:16. Find the ratio of Corresponding areas of these triangles.

(a) 9:16 (b) 3:4 (c) 81:256 (d) 18:32

(v) Find the ratio AC:CE.

(a) 1: 3 (b) 3 : 1 (c) 1 : 4 (d) 4 : 1

383) Anjali places a mirror on level ground to determine the height of a tree (see the diagram). She stands at a certain distance so that she can see the top of the tree reflected from the mirror. Anjali's eye level is 2 m above the ground. The distance of Anjali and the tree from the mirror are 1.4 m and 2.8 m respectively.



(i) What are the two △ s formed in the above diagram, which are used to calculate the height of the tree?

(a) △ s QMM' and PQM (b) △ s PQM and RSM (c) △ s RM'M and MRS (d) △ s PM'M and RM'M

(ii) State the criterion of similarity, that will be used in the above found triangles.

(a) RHS (b) SSS (c) SAS (d) AA

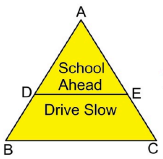
(iii) What is the height of the tree?

(a) 4 m (b) 5 cm (c) 6 m (d) 7 cm

(iv) What is the distance between Rashmi and Gulmohar tree?

(a) 3.2 m (b) 5.2 m (c) 4.2 m (d) 2.2 m

384) A group of students to volunteer are working in making a safety board for school. They prepared once triangular safety board for their school with title "School Ahead" and "Drive Slow" in two parts of the triangular board as shown in below figure.



$DE \parallel BC$

(i) If AD = 2 cm, BD = 5 cm and AE = 3 cm, then, EC = ?

(a) $\frac{15}{2}$ **(b)** $\frac{3}{5}$ **(c)** $\frac{1}{5}$ **(d)** $\frac{6}{5}$

(ii) If AD = 3 cm, AB = 9 cm, BC = 6 cm, then DE = ?

(a) 4 cm (b) 3 cm (c) 2 cm (d) 1 cm

(iii) If $\angle$ A = 60^o and $\angle$ ADE = 50^o then $\angle$ C = ?

(a) 70^o (b) 75^o (c) 85^o (d) 40^o

(iv) Which of the folllowing is correct?

(a) $\Delta ADE \sim \triangle ABC$ **(b)** $\Delta ADE \cong \Delta ABC$ **(c) Both (i) & (ii) (d) None of these**

(v) What is the ratio of ar $(\triangle ADE)$ to ar $(\triangle ABC)$?

(a) $\frac{\text{ar}(\Delta ADE)}{\text{ar}(\Delta ABC)} = \frac{AD^2}{AB^2}$ **(b)** $\frac{\text{ar}(\Delta ADE)}{\text{ar}(\Delta ABC)} = \frac{AD}{AB}$ **(c)** $\frac{\text{ar}(\Delta ADE)}{\text{ar}(\Delta ABC)} = 1$ **(d) None of thses**

385) A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing Is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor.

$$\text{Scale factor} = \frac{\text{length in image}}{\text{corresponding length in object}}$$

If one shape can become another using revising,then the shapes are sinilar. Hence,two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

This means that a length of 1 cm on the photograph above corresponds to a length of 200 cm, or 2 metres, on the actual engine. The scale can also be written as the ratio of two lengths.

(a) If the length of the modelis 11cm, then the overall length of the engine in the photograph above, including the couplings(mechanism used to Connect) is

(i) 22 cm (ii) 220 cm (iii) 220 m (iv) 22 m

(b) What will affect the similarity of any two polygons?

(i) They are flipped horizontally
(ii) They are dilated by a scale factor.
(iii) They are translated down
(iv) They are not the mirror image of one another

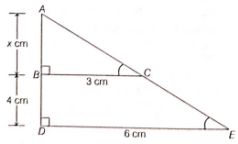
(c) What is the actual width of the door if the width of the door in photograph is 0.35 cm?

(i) 0.7 m (ii) 0.7 cm (iii) 0.07 cm (iv) 0.07 m

(d) If two similar triangles have a scale factor of 5 : 3, which statement regarding the two triangles is true

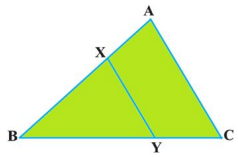
(i) The ratio of their perimeters is 15 : 1
(ii) Their altitudes have a ratio 25 : 15
(iii) Their medians have a ratio 10 : 4
(iv) Their medians have a ratio 10 : 4

(e) The length of AB in the given figure is



(i) 8 cm (ii) 6 cm (iii) 4 cm (iv) 0.07m

386) In one of the residential colony of city, there is a triangular park ABC available. The Resident Welfare Association of the colony wishes to divide this park into two parts of equal areas. One for planting trees and raising a lawn and the other for providing place for children park for playing activities. One of the members Ram suggested to draw a line segment XY || BC for the same.



(i) Which is the correct similarity criteria is used for above triangles ABC and XBY?

(a) SSS (b) AAA (c) RHS (d) ASA

(ii) What is the ratio of areas of $\triangle \mathrm{ABC} : \triangle \mathrm{XBY}?$

(a) 1 : 2 (b) 2 : 1 (c) 1 : 4 (d) $1 : \sqrt{2}$

(iii) If $\angle \mathrm{BXY} = 60^{\circ}$ then $\angle \mathrm{BAC}$ is :

(a) 80° (b) 60° (c) 140° (d) 100°

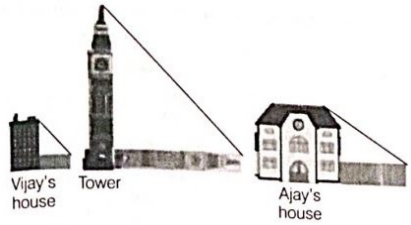
(iv) If the ratio of areas of $\Delta \mathrm{BXY} : \triangle \mathrm{ABC}$ is 1 : 2, then XB : AB is

(a) 1 : 2 (b) 1 : 4 4 (c) 2 : 4 (d) $1 : \sqrt{2}$

(v) If the area of $\Delta \mathrm{AXY}$ is 128 m^2, then what will be area of Δ CXY.

(a) 128 m^2 (b) 248 m^2 (c) 256 m^2 (d) 48 m^2

387) Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house, if 20 m when Vijay's house casts a shadow 10m long on the ground.
At the same time, the tower casts a shadow 50 m long on the ground and the house of Aiay casts 20 m shadow on the ground.



(i) What is the height of the tower?

(a) 20 m (b) 50 m (c) 100 m (d) 200 m

(ii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12 m?

(a) 75 m (b) 50 m (c) 45 m (d) 60 m

(iii) What is the height of Ajay's house?

(a) 30 m (b) 40 m (c) 50 m (d) 20 m

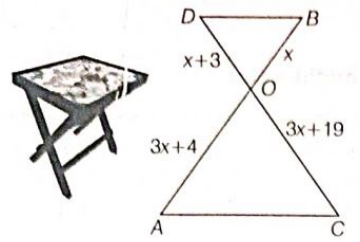
(iv) When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Ajay's house?

(a) 16 m (b) 32 m (c) 20 m (d) 8 m

(v) When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Vijay's house?

(a) 15 m (b) 32 m (c) 16 m (d) 8 m

388) In the figure given below, a folding table is shown. The legs of the table are represented by line segments AB and CD intersecting at O. Join AC and BD. Considering table top is a parallel to the ground and OB = x, OD = x + 3, OC = 3x + 19 and OA = 3x + 4, answer the following questions.



(i) Prove that Δ OAC is similar to Δ OBD

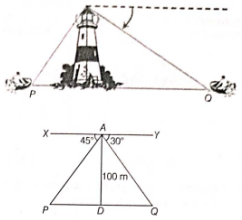
(ii) Prove that $\frac{OA}{AC} = \frac{OB}{BD}$

(iii) (a) Observe the figure and find the value of x. Hence, find the length of OC.

Or

(b) Observe the figure and find $\frac{BD}{AC}$.

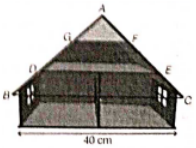
389) A boy is standing on the top of light house. He observed that Boat Pand Boat Qare approaching the light house from opposite directions. He finds that angle of depression of Boat P is 45° and angle of depression of Boat Q is 30°. He also knows that height of the light house is 100 m.



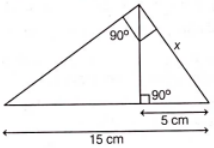
Based on the above information, answer the following questions.
(i) What is the measure of ∠APD?
(ii) If ∠YAQ 30°, then ∠AQDis also 30°. Why?
(iii) How far is Boat P from the light house? Or How far is Boat Q from the light house?

390) Three villages X, Y and Z are situated at the three ends of a triangular region bounded by three roads. The lengths of the roads connecting X to Y, Y to Z and Z to X are in the ratio 5 : 3 : 4. The total lengths of the three roads are 180 km.
A new road is to be constructed parallel to the longest road. A team of three researchers Mayank, Biju and Shanti work on the technical specifications of the new road construction. Each of them makes a scale drawing of the region using different scale factors. Based on the above information, answer the following questions.
(i) Which types of triangles are included in their scale drawings, similar or congruent? Why?
(ii) The proposed road will meet the road between Y and Z in the middle. How far is the Village Y (in km) from the meeting point of the roads?
(iii) In all the three scale drawings, the actual length of the new road is provided. Would the road length be the same in their maps? Justify your answer.

391) A dollhouse with a triangular roof is shown below



The front and back triangles are equilateral triangles with side lengths 45 cm each. Panels parallel to the floor of the dollhouse are used to make the attic. The sides DE and GFof the panels divide the sides AB and AC into three equal parts.
Based on the above information, answer the following questions.
(i) Which criteria of similar triangles do not apply to △AGF and △ADE?
(a) AAA
(b) SSS
(c) SAS
(d) RHS
(ii) The area of △ABC is 692 cm^2, What is the area of the plank AGF?
(iii) What is the height (in cm) of the attic?
(iv) Two Overlapping right triangles are shown below. What is the value of x?



(a) 4 cm
(b) 5√3 cm
(c) 10 cm
(d) 37.5 cm

392) Some concrete water towers have been built to supply water to the localities nearby. They are usually mounted with a cylindrical tank. A water tower for a locality is 40 m high.

Based on the above information, answer the following questions.

(i) The water tower cast a shadow of 25 m. At the same time, a tree near it casts a shadow of 5 m. What is the height of the tree?

(a) 3.12 m

(b) 8 m

(c) 20 m

(d) 25 m

(ii) A scale model of the water tower of 100 cm height is created. The height of its pillars is 75 cm each. What is the height of a pillar (in m) in the actual water tower?

(a) 7.5

(b) 25

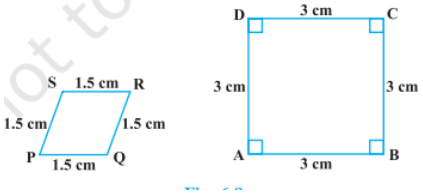
(c) 30

(d) 53.4

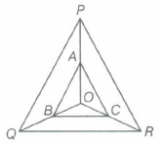
(iii) Dharmendra made a scale model of a water tower for another locality. The radius of the reservoir in the model is 6 cm and its volume is 216cm^3 The radius of the actual water reservoir is 2.5 m. What is its volume?

5 Marks 134 x 5 = 670

393) State whether the following quadrilaterals are similar or not.



394) In the given figure, A, B and C are points on OP, OQ and OR respectively, such that $AB \parallel PQ$ and $AC \parallel PR$. Show that $BC \parallel QR$.



395) The diagonals of a quadrilateral ABCD intersect each other at the point O, such that $\frac{\text{AO}}{\text{BO}} = \frac{\text{CO}}{\text{DO}}$. Show that ABCD is a trapezium.

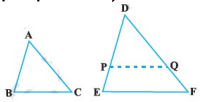
396) Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at the point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$.

397) D is a point on the side BC of $\triangle ABC$ such that $\angle ADC = \angle BAC$. Show that CA^2 = CB x CD.

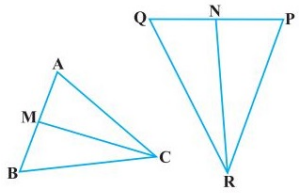
398) A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

399) Sides AB and AC and median AD of $\triangle$ ABC are respectively proportional to sides PQ and PR and median PM of another $\triangle$ PQR. Show that $\triangle$ ABC ~ $\triangle$ PQR.

400) If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or proportion) and hence the two triangles are similar.

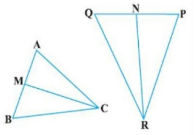


401) In figure CM and RN are respectively the medians of Δ ABC and Δ PQR. If Δ ABC ~ Δ PQR, prove that :
Δ AMC ~ Δ PNR

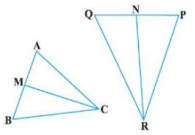


402) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

403) In figure CM and RN are respectively the medians of Δ ABC and Δ PQR. If Δ ABC ~ Δ PQR, prove that :
$\frac{\mathrm{CM}}{\mathrm{RN}} = \frac{\mathrm{AB}}{\mathrm{PQ}}$



404) In figure CM and RN are respectively the medians of Δ ABC and Δ PQR. If Δ ABC ~ Δ PQR, prove that :
Δ CMB ~ Δ RNQ



405) If $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, AB = 5 cm, AC = 8 cm and DF = 75 cm, then find DE and $\angle F$

406) A 15 m high tower casts a shadow 24 m long at a certain time and at the same time, telephone pole caste a shadow 16 m long. Find the height of the telephone pole.

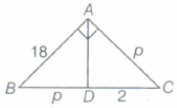
407) Let $\triangle ABC \sim \triangle DEF$ and their areas be respectively 64 cm^2 and 121 cm^2 If EF = 15.4 cm^2 then find BC.

408) Two trees of heights x and y are d m apart.
(i)Prove that the height of the point of intersection of the line joining the top of each tree to the foot of the opposite trees is given by $\frac{xy}{x+y}m$
(ii) Which mathematical concept is used in this problem?
(iii) What are the values depicted here?

409) Shweta prepared two posters on National Integration for decoration on Independence day on triangular sheets (say ABC and DEF). The sides AB and AC and the perimeter P_1 of $\triangle ABC$ are respectively four times the corresponding sides DE and DF and the perimeter P_2 of $\triangle DEF$. Are the two triangular sheets similar? If yes, find $\frac{ar(\triangle ABC)}{ar(\triangle DEF)}$. What values can be indicated through celebration of national festivals?

410) A man steadity goes 8 m due East and then 6 m due North.
(i) Find the distance from initial point to last point.
(ii) Which mathematical concept is used in this problem?
(iii) What value is indicated in this question?

411) In the given figure, if $\triangle ADB \sim \triangle ADC$, then find the value of p.

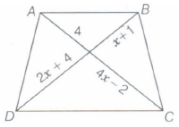


412) Prove that the line segments joining the mid-points of the sides of a triangle form four triangle, each of which is similar to the original triangle.

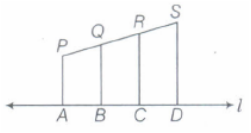
413) ABCD is a trapezium with $AB \parallel DC$. If $\triangle AED \sim \triangle BEC$, then prove that AD = BC.

414) In a $\triangle ABC$, P and Q are points in AB and AC, respectively and $PQ \parallel BC$. Prove that the median bisects PQ.

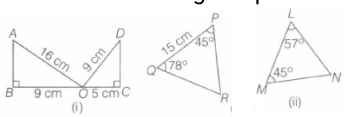
415) In the given figure, if $AB \parallel CD$, then find the value of x.



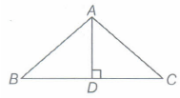
416) In the given figure, PA, QB, RC and SD are all perpendiculars to a line l, AB = 6 cm, BC = 9 cm, CD = 12 cm and SP = 36 cm. Find PQ, QR and RS.



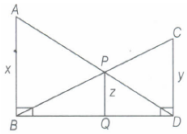
417) State whether the given pairs of triangles are similar or not. In case of similarity, mention the criterion.



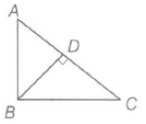
418) In the given figure, if $\angle BAC$ = 90° and $AD \perp BC$. prove thart $AD^2 = BD.CD$



419) In the given figure, $AB \parallel PQ \parallel CD$, AB = x units, CD = y units and PQ = z units. Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



420) In the adjoining figure, ABC is a triangle right angled at B and $BD \perp AC$. If AD = 4 cm and CD = 5 cm. find BD and AB.



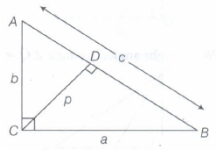
421) Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of any equilateral triangle described on one its diagonals.

422) AD is an altitude of an equilateral $\triangle ABC$. In AD as base another equilateral triangle is ADE is constructed. Prove that $ar(\triangle ADE) = ar(ABC) = 3:4$.

423) A ladder 17 m long, reaches at a window of a building 15 m above the ground. Find the distance of the foot of the ladder from the building.

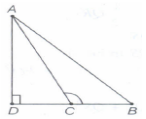
424) In $\triangle PQR, PD \perp QR$ such that D lies on QR. If PQ = a, PR = b, QD = c and DR = d, then prove that (a + b) (a - b) = (c + d) (c - d).

425) $\triangle ABC$ is a right triangle in which $\angle C =$ 90° and $CD \perp AB$. If BC = a, CA = b, AB = C and CD = p, then prove that
(i) cp = ab
(ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

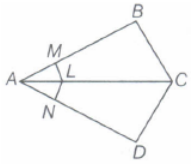


426) D is a point on the side BC of an equilateral triangle ABC, such that $DC = \frac{1}{4}BC$. Prove that $AD^2 = 13CD^2$.

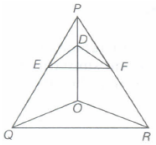
427) In $\triangle ABC, \angle C$ is an obtuse angle, $AD \perp BC$ and $AB^2 = AC^2 + 3BC^2$. Prove that BC = CD.



428) In the given figure, if $LM \parallel CB$ and $LN \parallel CD$, prove that $\frac{AM}{AB} = \frac{AN}{AD}$.

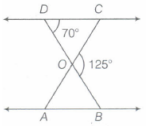


429) In the given figure, $DE \parallel OQ$ and $DF \parallel OR$. Show that $EF \parallel QR$.



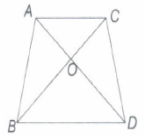
430) ABCD is a trapezium, in which $AB \parallel DC$ and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

431) In the given figure, $\triangle ODC \sim \triangle OBA, \angle BOC = 125^\circ$ and $\angle CDO = 70^\circ$. Find $\angle DOC, \angle DCO$ and $\angle OAB$.



432) Diagonals of a trapezium ABCD with $AB \parallel DC$ intersect each other at the point O. If AB = 2CD, then find the ratio of the areas of $\triangle AOB$ and $\triangle COD$.

433) In the given figure, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, then show that $\frac{ar(\triangle ABC)}{ar(\triangle DBC)} = \frac{AO}{DO}$



434) If the areas of two similar triangles are equal, then prove that they are congruent.

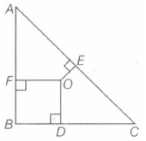
435) D, E and F are respectively the mid-points of sides AB, BC and CA of $\triangle ABC$. Find the ratio of the areas of $\triangle DEF$ and $\triangle ABC$.

436) Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of an equilateral triangle described on one of its diagonals.

437) ABC is an equilateral triangle of side 2a. Find each of its altitudes.

438) Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

439) In the given figure, O is a point in the interior of a $\triangle ABC, OD \perp BC, OE \perp AC$ and $OF \perp AB$.



$OA^2 + OB^2 + OC^2 - OD^2 - OE^2 - OF^2 = AF^2 + BD^2 + CE^2$

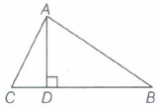
440) A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

441) An aeroplane leaves an airport and files due North at a speed of 1000 km/h. At the same time, another aeroplane leaves the same airport and files due West at a speed of 1200 km/h. How far apart will be the two planes after $1\frac{1}{2}$ h?

442) Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

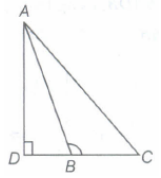
443) D and E are points on the sides CA and CB respectively of $\triangle ABC$ right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$

444) The perpendicular from A on side BC of a $\triangle ABC$ intersects BC at D such that DB = 3 CD (see figure). Prove that $2\ AB^2 = 2\ AC^2 + BC^2$

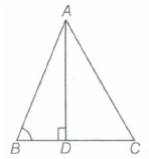


445) In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

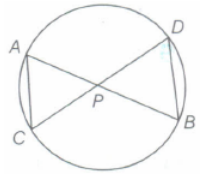
446) In the given figure, ABC is a triangle in which $\angle ABC > 90^\circ$ and $AD \perp CB$ produced. Prove that $AC^2 = AB^2 + BC^2 + 2\ BC\ .\ BD$



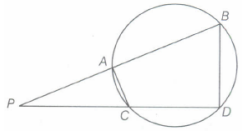
447) In the given figure, ABC is a triangle in which $\angle ABC < 90^\circ$ and $AD \perp BC$. Prove that $AC^2 = AB^2 + BC^2 - 2\ BC\ .\ BD$



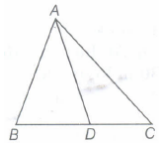
448) In the adjoining figure, two chords AB and CD intersect each other at the point P. Prove that $\triangle APC \sim \triangle DPB$



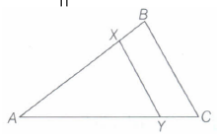
449) In the given figure, two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that $\triangle PAC \sim \triangle PDB$



450) In the given figure, D is a point on side BC of $\triangle ABC$, such that $\frac{BD}{CD} = \frac{AB}{AC}$. Prove that AD is the bisector of $\angle BAC$.

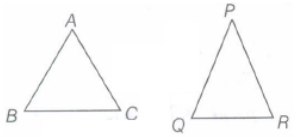


451) There is a triangular park ABC in a colony (as shown in figure). The Resident Welfare Association of the colony wishes to divide this park into two parts of equal areas - one for planting trees and raising a lawn and the other for providing place for children playing activities. One of the members Salma suggested to draw a line segment $XY \parallel BC$ for this purpose.



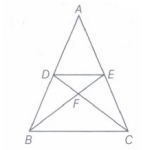
(i) State how this line segment XY can be drawn, so that X and Y lie on AB and AC, respectively?
(ii) What value is depicted from this action?

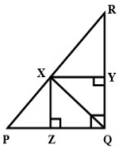
452) Consider two similar $\triangle ABC$ and $\triangle PQR$ as shown in the following figure.



(i) Prove that, if the areas of $\triangle ABC$ and $\triangle PQR$ are equal, then the $\triangle ABC$ and $\triangle PQR$ are always congruent.
(ii) If the sides of two similar triangles are in the ratio 2 : 5, then find the ratio of the areas of these triangles.
(iii) If the shape of the two triangles are same but size is different, then both the triangles are congruent. Is this statement true? Justify it.
(iv) Suppose, a person wants to select the triangle having maximum area. For maximum area, he has to select the $\triangle PQR$. What his decision shows?

453) In the given figure, if $DE \parallel BC$ and AD : DB = 5 : 4, then find $\frac{ar(\triangle DFE)}{ar(\triangle CFB)}$.



454) 

Δ PQR is right angled at Q. QX $\perp$ PR, XY $\perp$ RQ and XZ $\perp$ PQ are drawn. Prove that XZ^2 = PZ x ZQ.

455) In $\triangle$ ABC, the mid-points of sides BC, CA and AB are D, E and F respectively. Find ratio of ar ($\triangle$ DEF) to ar ($\triangle$ ABC).

456) In $\triangle$ ABC, if $\angle$ ADE = $\angle$ B, then prove that $\triangle$ ADE~$\triangle$ ABC. Also, if AD = 7.6 cm, AE = 7.2 cm, BE = 4.2 cm and BC = 8.4 cm, then find DE.

457) In the figure, $\angle$ BED = $\angle$ BDE and E is the middle poi.nt of Be. Prove that $\frac{AF}{CF} = \frac{AD}{BE}$.

458) In the right triangle, B is a point on AC such that AB + AD = BC + CD. If AB = x, BC = h and CD = d, then find x (in term of h and d).

459) In $\triangle$ ABC, AD is a median and 0 is any point on AD. BO and CO on producing meet AC and AB at E and F respectively. Now AD is produced to X such that OD = DX as shown in figure.
Prove that:
(i) EF II BC
(ii) AO : AX = AF : AB

460) ABCO is a rhombus whose diagonal AC makes an angle a with AB. If cos $\alpha = \frac{2}{3}$ and OB = 3 cm find the length of its diagonals AC and BD.

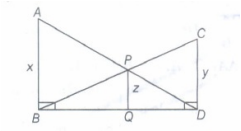
461) Triangle ABC is right angled at Band 0 is the mid-point BC. Prove that $AC^2 = 4AD^2 - 3AB^2$.

462) If the area of two similar triangles are equal. prove that they are congruent.

463) In $\triangle$ ABC, AD is the median to BC and in PQR, PM is the median to QR.If. Prove that $\triangle$ ABC~$\triangle$ PQR.

464) In the following figure, $\triangle$ FEC$\cong$ $\triangle$ GBD and $\angle$ 1= $\angle$ 2. Prove that $\triangle$ ADE~$\triangle$ ABC.

465) In the given figure, AB II PQ II CD, AB = x units, CD = y units and PQ = z units, prove that $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$.



466) In the given figure, D and E trisect BC Prove that $8AE^2 = 3AC^2 + 5AD^2$.

467) Let ABC be a triangle and D and E be two points on side AB such that AD = BE. If DP II BC and EQ II AC, then prove that PQ II AB.

468) Prove that the ratio of the areas of two similaoswall triangles is equal to the square of the ratio of their corresponding meidans.

469) Prove that in a right triangle, the square of the hypotenuse is equal to sum of squares of other two sides. Using the above result, prove that, in rhombus ABCD, $4AB^2 = AC^2 + BD^2$.

470) Vertical angles of two isosceles triangles are equal. If their areas are in the ratio 16 : 25, then find the ratio of their altitudes drawn from vertex to the opposite side.

471) In the figure, ABC is a right triangle, right angled at B. AD and CE are two medians drawn from A and C respectively. If AC = 5 cm and AD =$\frac{3\sqrt{5}}{2}$ cm, find the length of CE.

472) If a line drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Prove it.

473) In a trapezium ABCD, AB II DC and DC = 2AB. EF II AB, where E and F lie on BC and AD respectively such that $\frac{BE}{EC}=\frac{4}{3}$. Diagonal DB intersects EF at G. Prove that, 7EF =11AB.

474) In ABC, AD $\perp$ BC and point D lies on BC such that 2 DB = 3 CD. Prove that $5AB^2 = 5AC^2 + BC^2$.

475) There are three villages A, Band C such that the distance from A to Bis 7 km from B to C is 5 km and C to A is 8 km. The gram-pradhan wants to dig, a
well in such a way that the distance of the well from each village is equal.
(i) Which mathematical concept is used to solve the above question?
(ii) What should be the location of the well ?
(iii) Which value is depicted by gram-pradhan ?

476) Avertical row of trees 12m long casts a shadow 8m long on the ground, At the same time a tower casts the shadow 40 m long on the ground.
(i) Determine the height of the tower.
(ii) Which mathematical concept is used in this problem?
(iii) What is the value of the trees in our life?

477) Two trees of height a and bare p metre apart.
(i) Prove that the height of the point of intersection of the lines joining the top of each tree to the foot of the opposite trees is given by $\frac{ab}{a+b}m$.
(ii) Which mathematical concept is used in this problem?
(iii) What is the value of trees in our life?

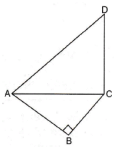
478) Show that in a right angle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

479) A ladder reaches a window which is 12 m above the ground on one side of the street, keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 9 m high. Find the width of the street if the length of the ladder is 15 m.

480) A ladder 25 m long reaches a window of a building 20 m above the ground. Determine the distance of the foot of the ladder from the building.

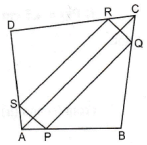
481) A ladder is placed in such a way that its foot is at a distance of 5 m from a wall and its tip reaches a window 12 m above the ground. Determine the length of the ladder.

482) In a quadrilateral ABCD, $\angle B=90^\circ$,

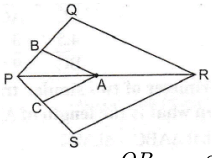


$AD^2 = AB^2 + CD^2 + BC^2$. prove that $\angle ACD = 90^\circ$.

483) In the given fig. ABCD is a quadrilateral P, Q, R and S are the points of trisection of the sides AB, BC, CD and DA respectively.Prove that PQRS is a parallelogram.

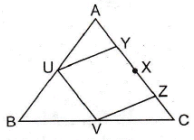


484) In figure, BA || QR, and CA || SR.



Prove that $\frac{QB}{BP} = \frac{SC}{CP}$

485) In ΔABC, X is any point on AC. If Y, Z, U and V are the middle points on AX, XC, AB and BC respectively, then, prove that UY || VZ and UV || YZ.

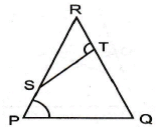


486) In figure, LM II NO and LN ll PQ.If MP =$\frac{1}{3}$ MN find the ratio of the areas of ΔLMN and ΔQNP.

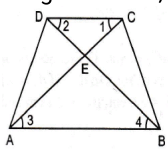
487) Equiangular triangles are drawn on the sides of right angled triangle in which perpendicular is double of the base. Show that area of the triangle on the hypotenuse is the sum of the areas of the other two triangles.

488) ABCD is a trapezium in which AB is parallel to DC and the diagonals AC, BD cut at X. A line is drawn through C parallel to DA to cut DB, produced if necessary at Y. Prove that :
(i) ΔAXD, ΔBXC are equal in area
(ii) ΔAXD~ΔCXY
(iii) $\frac{XB}{XY} = \frac{XA^2}{XC^2}$

489) If $\angle P = \angle RTS$,
Then show that $\angle PQR = \angle RST$

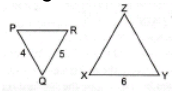


490) In fig $\angle 1 = \angle 3$, $\angle 2 = \angle 4$

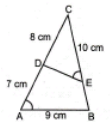


DE = 4,CE = x + 1, AE = 2x + 4; BE = 4x - 2. Find x.

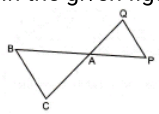
491) In figure, ΔPQR - ΔXYZ. If PQ = 4 cm, QR = 5 cm and XY = 6 cm, then find YZ



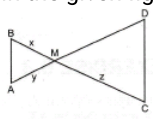
492) In the figure,if. ∠A = ∠CED,AB = 9cm, AD = 7 cm, CD = 8 cm and CE = 10 cm. Find DE.



493) In the given figure, ΔACB ~ ΔAQP. If BC = 8 cm, PQ = 4 cm, BA = 6.5 cm. AQ = 2.8 cm, find CA and PA.

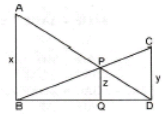


494) In the given figure, ΔAMB ~ ΔCMD

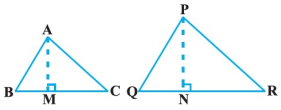


Determine MD in terms of x, y and z.

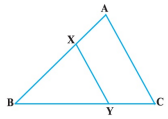
495) In figure AB || PO || CD, AB = x units, CD = y units and PQ = z units, prove that $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$



496) The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. We are given two triangles ABC and PQR such that D ABC ~ D PQR.



497) In the line segment XY is parallel to side AC of D ABC and it divides the triangle into two parts of equal areas. Find the ratio $\frac{AX}{AB}$.

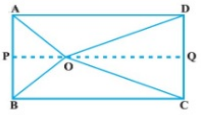


498) In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

499) In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

500) A ladder is placed against a wall such that its foot is at a distance of 2.5 m from the wall and its top reaches a window 6 m above the ground. Find the length of the ladder.

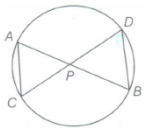
501) O is any point inside a rectangle ABCD Prove that $OB^2 + OD^2 = OA^2 + OC^2$.



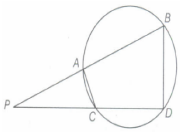
502) PQR is a triangle right angled at P and M is a point on QR such that PM ⊥ QR. Show that PM^2 = QM . MR.

503) Prove that the sum of the squares of the diagonals of parallelogram is equal to the sum of the squares of its sides.

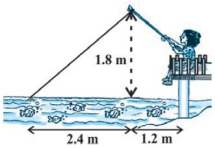
504) In the adjoining figure, two chords AB and CD intersect each other at the point P. Prove that
AP. PB = CP . DP



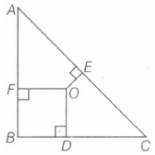
505) In the given figure, two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that
PA. PB = PC . PD



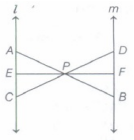
506) Nazima is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that her string (from the tip of her rod to the fly) is taut, how much string does she have out see Figure? If she pulls in the string at the rate of 5 cm per second, what will be the horizontal distance of the fly from her after 12 seconds?



507) In the given figure, O is a point in the interior of a $\triangle ABC, OD \perp BC, OE \perp AC$ and $OF \perp AB$.
$AF^2 + BD^2 + CE^2 = AE^2 + CD^2 + BF^2$



508) In the given figure, IIIm and line segments AB, CD and EF are concurrent at point P. Prove that
$\frac{AE}{BF} = \frac{AC}{BD} = \frac{CE}{FD}$

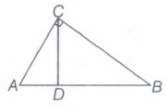


509) PQRS is a trapezium with PQ II SR. Diagonals PR and SQ intersect at M and ΔPMS - ΔQMR. Prove that PS = QR.

510) The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

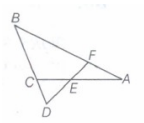
511) If a perpendicular is drawn from the vertex of right angle of a right angled triangle to the hypotenuse; then triangles on both sides of the perpendicular are similar to the whole triangle and to each other.

512) In figure, $\angle ACB = 90^\circ$ and $CD \perp AB$ prove that CD^2 = BD x AD.



513) A farmer has a piece of land in the shape of an equilateral triangle. He divides his entire land among his four children in equal parts as shown in following figure. P, 0 and R are mid-points of sides AB, BC and AC respectively. A student find that ratio of area of ilPORto the area of ΔABC is 2 : 3. Using properties of similar triangles, a student of class X at once said, "It is false".
(i) Doyou agree with student?
(ii) Verify PQ $= \frac{1}{2}BC$

514) In the given figure, ∠AEF = ∠AFE and E is the mid-point of CA Prove that $\frac{BD}{CD} = \frac{BF}{CE}$



515) D is the mid-point of side BC of a ΔABC . AD is bisected at the point E and BE produced cuts AC at the point X.