Ravi Maths Tuition

Areas of Parallelograms and Triangles

9th Standard

Mathematics

Multiple Choice Question 60 x 1 = 60

1) Area of a parallelogram is equal to

(a) $\frac{1}{2} \times Base \times Corresponding \quad altitude$ (b) $\frac{1}{3} \times Base \times Corresponding \quad altitude$

(c) $\frac{1}{4} \times Base \times Corresponding \quad altitude$ (d) $Base \times Corresponding \quad altitude$

2) Area of a triangle is equal to

(a) $\frac{1}{2} \times Base \times Corresponding \quad altitude$ (b) $\frac{1}{4} \times Base \times Corresponding \quad altitude$

(c) $\frac{1}{3} \times Base \times Corresponding \quad altitude$ (d) $Base \times Corresponding \quad altitude$

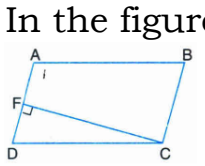
3) The areas of a parallelogram and a triangle are equal and they lie on the same base. If the altitude of the parallelogram is 2 cm, then the altitude of triangle is

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

4) In the figure, the area of parallelogram PQRS is:

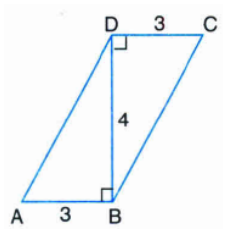
(a) $PQ \times QB$ (b) $QR \times QC$ (c) $SR \times QC$ (d) $PS \times SA$

5) In the figure, ABCD is a parallelogram of area 128 cm^2 . If CF = 16 cm, the length of AD is



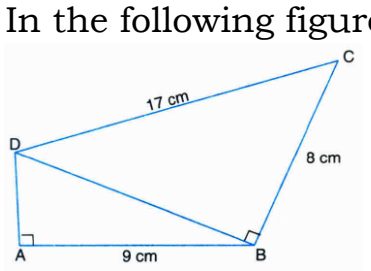
(a) 8 cm (b) 4 cm (c) 16 cm (d) 10 cm

6) In the following figure, find the area of quad. ABCD.



(a) 7 square units (b) 12 square units (c) 6 square units (d) 24 square units

7) In the following figure, find the area of quad. ABCD.

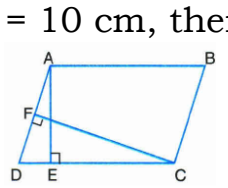


(a) 114 cm^2 (b) 56cm^2 (c) 28cm^2 (d) 14 cm^2

8) If length of the diagonal of a square is 8 cm, then its area will be

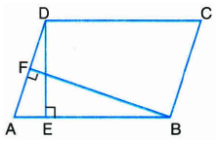
(a) 64cm^2 (b) 32cm^2 (c) 16cm^2 (d) 48cm^2

9) In the following figure, ABCD is a parallelogram, $AE \perp DC$ and $CF \perp AD$. If AB = 16 cm, AB = 8 cm and CF = 10 cm, then AD =



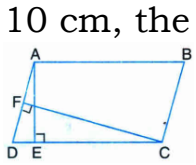
(a) 16 cm (b) 12.8 cm (c) 8 cm (d) 10 cm

10) In the following figure, ABCD is a parallelogram. $DE \perp AB$ and $BF \perp AD$. If AB = 12 cm, DE = 6 cm and AD = 8 cm, find BF.



(a) 8 cm (b) 6 cm (c) 12 cm (d) 9 cm

11) In the given figure, if ABCD is a parallelogram, $CF \perp AD$ and $AE \perp DC$ If AB = 16 cm, AE = 4 cm and CF = 10 cm, the length of BC is:



(a) 5.8 cm (b) 6.4 cm (c) 7.5 cm (d) 12 cm

12) Two parallelograms are on equal bases and between the same parallels. The ratio of their areas is

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

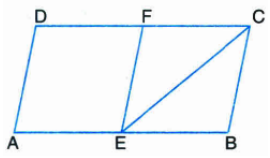
13) If a rectangle and a square stand on the same base and between the same parallels, then the ratio of their areas is

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

14) ABCD is a quadrilateral whose diagonal AC divides it into two parts equal in area, then ABCD is

(a) a rhombus (b) a parallelogram (c) a kite (d) a trapezium

15) In the given figure, ABCD is a parallelogram. F and E are midpoints of CD and AB respectively. If area (BEC) = a sq. units, then the area (ABCD) (in sq. units) is equal to:

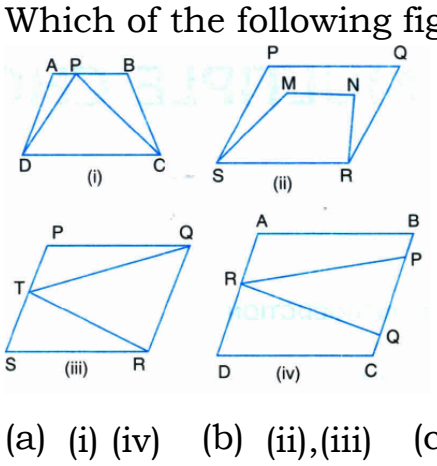


(a) 2a (b) a (c) 3a (d) 4a

16) If P, Q, Rand S are the midpoints of a rectangle of area 36 sq. cm, then PQRS is a parallelogram of area

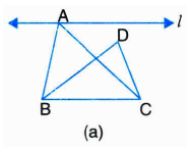
(a) 24 cm^2 (b) 18cm^2 (c) 12cm^2 (d) 9cm^2

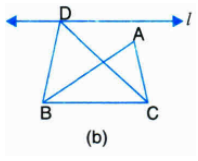
17) Which of the following figures lie on the same base and between the same parallels?

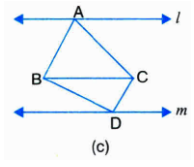


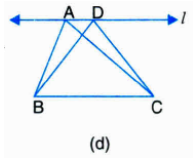
(a) (i) (iv) (b) (ii),(iii) (c) (ii),(iv) (d) (i),(iii)

18) In which of the following figures, ΔABC and ΔDBC lie on the same base and between the same parallels?

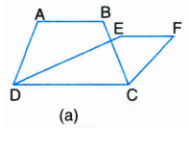
(a) 

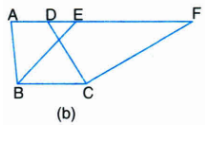
(b) 

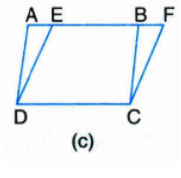
(c) 

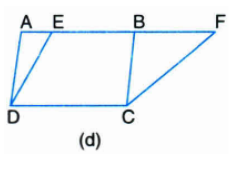
(d) 

19) Which of the following figures donot lie between the same parallels?

(a) 

(b) 

(c) 

(d) 

20) If a parallelogram and a triangle are on the same base and between the same parallels, then

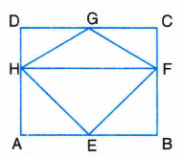
(a) area of the triangle = $\frac{1}{2}$ area of the parallelogram

(b) area of the triangle = area of the parallelogram

(c) area of the triangle = $\frac{1}{3}$ area of the parallelogram

(d) area of the triangle = $\frac{1}{4}$ area of the parallelogram

21) In the figure, if AB || DC and HF || AB, then which of the following is true?



(a) ar(GHF) = ar(DHFC) (b) 3 ar(GHF) = 2 ar(DHFC) (c) ar(GHF) = ar(HEF) (d) None of these

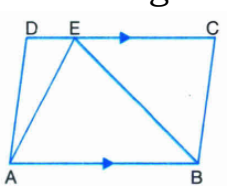
22) If a triangle and a parallelogram are on same base and between same parallels, then the ratio of the area of the triangle to the area of the parallelogram is

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

23) If a triangle and a rhombus are on the same base and between the same parallels, then ratio of area of triangle and area of rhombus are in the ratio:

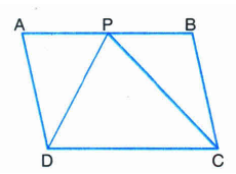
(a) 1:1 (b) 1:2 (c) 1:3 (d) 2:1

24) In the figure, ABCD is a parallelogram and ABE is a triangle, area (Δ ABE): area (ABCD) is



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

25) In the figure, ABCD is a parallelogram, then $\frac{ar(||gm\ ABCD)}{ar(\Delta DPC)}$ is:

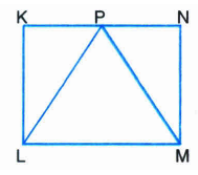


(a) 1:2 (b) 2:1 (c) 1:3 (d) 3:1

26) If the area of parallelogram ABCD = 25 cm^2 and on the same base CD, a ΔBCD is given such that ar (Δ BCD) = x, then the value of x is:

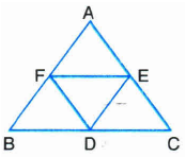
(a) 25cm^2 (b) 12.5cm (c) 12.5cm^2 (d) 25 cm

27) In the figure, Δ PLM and rectangle KLMN are shown. The ratio of the area of ΔPLM and rectangle KLMN is:



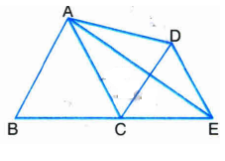
(a) 2:1 (b) 3:2 (c) 1:2 (d) 2:3

28) In Δ ABC, D, E, and F are the midpoints of BC, CA and AB respectively. If ar(ΔABC) = 56 cm^2, then ar(AEDF) is:



(a) 21 cm^2 (b) 28 cm^2 (c) 16 cm^2 (d) 14 cm^2

29) In the figure, AC is parallel to DE. ar(quad. ABCD) = 25 sq. units ar(ΔABC) = 17 sq. units Find ar(ΔACE).

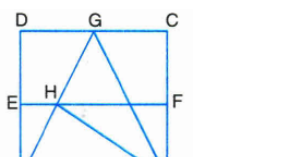


(a) 34 sq.units (b) 8 sq.units (c) 17 sq.units (d) 4 sq.units

30) A triangle ABC and a parallelogram ABCD have a common base BC and lie between the same parallels. If the area of triangle ABC is 34 cm^2 , what is the area of the parallelogram ABCD?

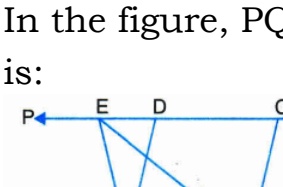
(a) 17 cm^2 (b) 68 cm^2 (c) 34 cm^2 (d) 8.5 cm^2

31) In the figure, parallelogram ABCD and ΔBCP are on the same base BC and between the same parallels. If ar(BCP) = 15 cm^2. Then ar(ABCD) equals:



(a) 7.5 cm^2 (b) 30 cm^2 (c) 15 cm^2 (d) 60 cm^2

32) Parallelogram ABCD and ΔAPD are on the same base AD and between the same parallels AD and BC. If the area of ΔAPD is 12 cm^2 , then the area of || gm ABCD (in cm^2) is:



(a) 6 (b) 12 (c) 18 (d) 24

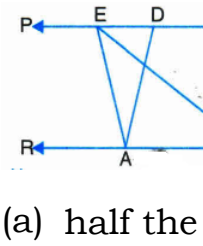
33) In a triangle, ABC, D, E and F are the midpoints of sides BC, CA and AB respectively, then:

(a) ar(BDEF) = $\frac{1}{4}$ar(ABC) (b) ar(AFE) = $\frac{1}{2}$ar(ABC) (c) ar(DEF) = $\frac{1}{2}$ar(ABC) (d) ar(BFEC) = $\frac{3}{4}$ar(ABC)

34) D and E are the points on the sides AB and AC respectively of triangle ABC such that DE || BC. If area of Δ DBC = 15 cm^2, then area ΔEBC is:

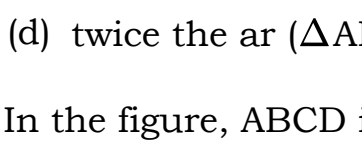
(a) 30 cm^2 (b) 7.5 cm^2 (c) 15 cm^2 (d) 20 cm^2

35) In the figure, ABCD is a square. E and F are midpoints of AD and BC respectively. The ratio of areas of Δ GAB and ΔHAB is:



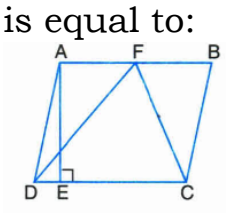
(a) 4:1 (b) 1:4 (c) 1:2 (d) 2:1

36) In the figure, PQ || RS, ABCD is a parallelogram and AEB is a triangle. Area of the parallelogram ABCD is:



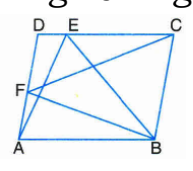
(a) half the area of triangle ΔAEB (b) equal to ar(Δ AEB) (c) thrice the area of ΔAEB (d) twice the ar (ΔAEB)

37) In the figure, ABCD is a parallelogram in which DC = 6 cm and $AE \perp DC$, AE = 4 cm. The area of (ΔDCF) is equal to:



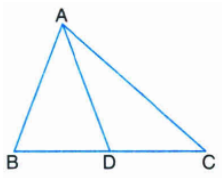
(a) 24 cm^2 (b) 10 cm^2 (c) 12 cm^2 (d) 20 cm^2

38) In given figure, ABCD is a parallelogram. If ar(ΔBFC) = 40 cm^2, then ar(Δ AEB) is equal to:



(a) 20 cm^2 (b) 40 cm^2 (c) 80 cm^2 (d) 10 cm^2

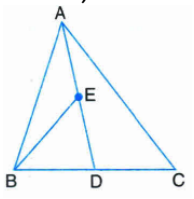
39) In figure, if AD is a median of ΔABC, then



(a) $ar(\Delta ABD) = ar(\Delta ADC)$ (b) $ar(\Delta ABD) > ar(\Delta ADC)$ (c) \(ar(\Delta ABD)

(d) $ar(\Delta ABD) = \frac{1}{3}ar(\Delta ABC)$

40) In a ΔABC, AD is a median. E is the mid-point of the median AD. If area (ΔBED) = 20 cm^2, then area (Δ ABC) will be

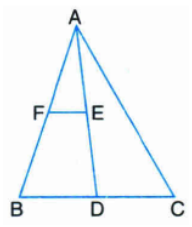


(a) 10 cm^2 (b) 5 cm^2 (c) 60 cm^2 (d) 80 cm^2

41) The area of ΔABC is 400 cm^2 If AD is a median of ΔABC, then the area of ΔABD (in cm^2) is:

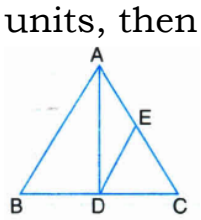
(a) 800 (b) 400 (c) 200 (d) 150

42) If the area of ΔABC is 800 cm^2 AD is a median, E is the midpoint of AD, F is the midpoint of AB, then the area of ΔAEF (in cm^2) is:



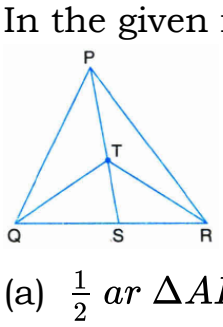
(a) 400 (b) 300 (c) 200 (d) 100

43) In the given figure, D is the midpoint of side BC of Δ ABC and E is the midpoint of AC. If ar (DEC) = 6 sq. units, then ar (ABC) (in sq. units) is equal to:



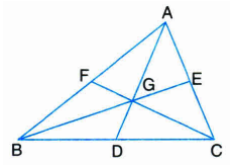
(a) 12 (b) 18 (c) 24 (d) 36

44) In the given figure, T is the mid-point of Median PS in a ΔPQR, then area ΔQTR is equal to:



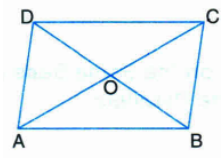
(a) $\frac{1}{2}$ $ar\ \Delta ABC$ (b) $\frac{1}{3}$ $ar\ \Delta ABC$ (c) $\frac{1}{4}$ $ar\ \Delta ABC$ (d) None of these.

45) If the medians of a triangle ABC intersect each other at G, then area of ΔAGB equals:



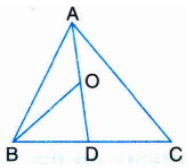
(a) $ar\ \Delta ABC$ (b) $\frac{1}{2}ar\ \Delta ABC$ (c) $\frac{1}{3}ar\ \Delta ABC$ (d) $\frac{1}{4}ar\ \Delta ABC$

46) In the figure, ABCD is a parallelogram. If area (AOD) = 12 cm^2 then area (ABCD) is:



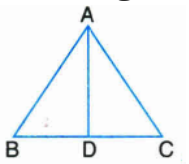
(a) 3 cm^2 (b) 24 cm^2 (c) 48 cm^2 (d) 36 cm^2

47) In the figure below, D is mid-point of side BC of Δ ABC. O is mid-point of AD. If area of ΔAOB 8 cm^2 , then area of ΔABC is:



(a) 16 cm^2 (b) 24 cm^2 (c) 32 cm^2 (d) 4 cm^2

48) In the given figure, AD is the median of ΔABC. The ratio of areas of ΔABD and ΔACD respectively is:

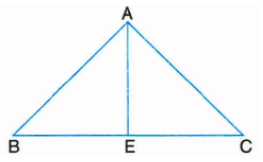


(a) 2:1 (b) 1:2 (c) 1:1 (d) 3:1

49) In ΔABC, E is the mid-point of median AD. Then the ratio of areas of ΔBED to area of ΔABC is:

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

50) In the figure, BC = 2BE and area (ΔABC) = 60 cm^2, then ar (ΔAEC) is:



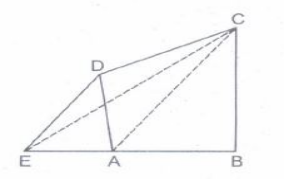
(a) 15 cm^2 (b) 20 cm^2 (c) 30 cm^2 (d) 40 cm^2

51) Which of the following is true for two figures having equal area?

(a) are always congruent (b) are never congruent (c) may or may not be congruent

(d) All of the above

52) ABCD is a parallelogram and AC is drawn parallel to ED. EC is joined. Which of the following is correct?

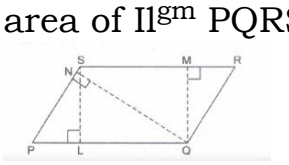


(a) ar ΔADC = ar ΔAEC. (b) ar ΔADC = ar ΔEDC (c) ar ΔADC = $\frac{1}{2}$ar ADCB. (d) None of the above

53) A median of a triangle divides it into two_____

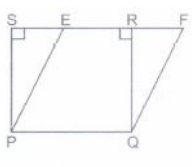
(a) congruent triangles. (b) triangles of equal area. (c) isosceles triangles. (d) right triangles

54) PQRS is a parallelogram such that SL ⊥ PQ, QN ⊥ PS and QM ⊥ SR. Then which of the following is the area of Il^{gm} PQRS?



(a) QR X QM (b) SR x NQ (c) PQ x SL (d) PS x QN

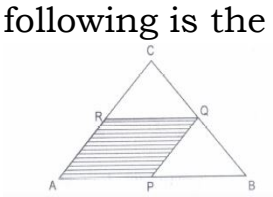
55) In the figure if parallelogram PQFE and rectangle PQRS are of equal area, then which of the following is true?



(a) Perimeter of PQRS > Perimeter of PQFE (b) Perimeter of PQRS = Perimeter of PQFE

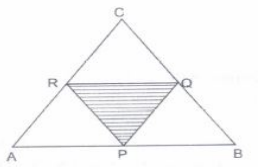
(c) Perimeter of PQRS < Perimeter of PQFE (d) Perimeter of PQRS ≤ Perimeter of PQFE

56) In the figure P, Q and R are the mid-points of the sides AB, BC and AC respectively. which of the following is the area of APQR?



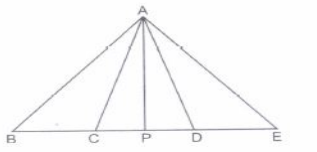
(a) ar (ΔABC) (b) $\frac{1}{2}$ ar (ΔABC) (c) $\frac{1}{4}$ ar (ΔABC) (d) $\frac{1}{3}$ ar (ΔQPB)

57) In the following figure P, Q and R are the mid-points of AB, BC and AC respectively. Which of the following is the area of ΔPQR?



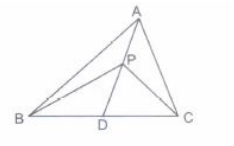
(a) $\frac{1}{2}$ ar (ΔABC) (b) $\frac{1}{3}$ ar (ΔABC) (c) $\frac{1}{4}$ ar (ΔABC) (d) None of the above

58) In the figure, BC = CD = DE and P is the mid-point of CD. Which of the following is the area of ΔAPC?|



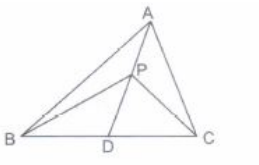
(a) $\frac{1}{3}$ ar (ΔABC) (b) $\frac{1}{2}$ ar (ΔABD) (c) $\frac{1}{6}$ ar (ΔABC) (d) All of the above

59) In the figure, AD is a median and P is a point on it. Which of the following is correct?



(a) ar(ΔAPB) = ar(ΔBPD) (b) ar(ΔAPB) = ar(ΔAPC) (c) ar(ΔAPB) = ar(ΔPDC) (d) All of the above

60) In the fig, area of ΔADC is equal to area of ΔABC. Which of the following is correct?



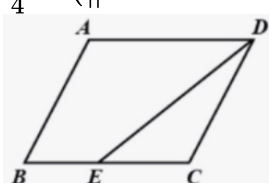
(a) DO > OB (b) DO = OB (c) DO < OB (d) DO ≤ OB

1 Marks 26 x 1 = 26

61) The perimeter of an isosceles triangle is 32 cm and its base is 12 cm. One of its equal side forms the diagonal of a parallelogram. Find the area of parallelogram.

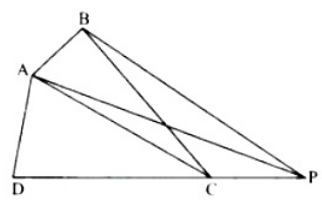
62) In the following figure, PORSis a quadrilateral such that diagonal QS⊥SR as well as QS⊥PQ. Find out ar(quad PQRS)

63) In the given figure, ABCD is a parallelogram and E is mid-point of BC. prove that ar (ΔDEC) = $\frac{1}{4}ar(||^{gm}\ ABCD)$



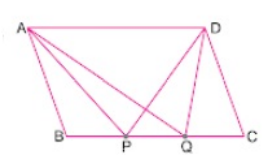
64) In the given figure, parallelogram ABCD and PBCO are given. If R is a point on PB, then show that $ar(\triangle QRC) = \frac{1}{2}ar(||^{m}ABCD)$

65) In the given figure, ABCD is a quadrilateral. BPis drawn parallel to AC and BPmeets DC (produced) at P. Prove that ar (ΔADP)= ar(quadrilateral ABCD)



66) ABCD is a parallelogram in which BC is produced to Esuch that CE = Be. AE intersects CD at F. If ar(ΔDFB) = 3cm^2 then find the area of the parallelogram ABCD.

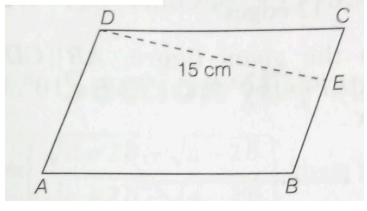
67) In the given figure, ABCD is a parallelogram. Points P and Q on BC trisect Be in three equal parts. Prove that $ar(\triangle APQ) = ar(\triangle DPQ) = \frac{1}{6}ar(||^{gm}ABCD)$



68) Two parallelograms are on same base and between the same parallels. What is the ratio of their areas.

69) If a triangle and parallelogram are on the same base and between same parallels, then find the ratio of the area of the triangle to the area of parallelogram.

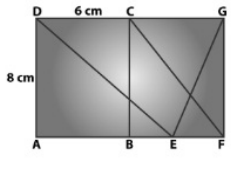
70) In the given figure, the area of parallelogram ABCD is 120 cm^2 then find the length of BC.



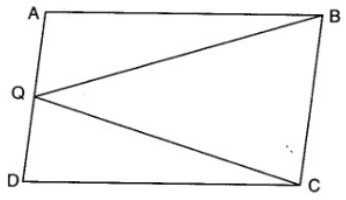
71) PQRS is a parallelogram, whose area is 180 cm^2 and A is any point on the diagonal QS. Then, the area of $\Delta ASR = 90\ cm^2$ This statement is true or false. Why?

72) In parallelogram ABCD, AB = 10 cm and the altitude corresponding to the sides AB and AD are respectively 7 cm and 8 cm. Find AD.

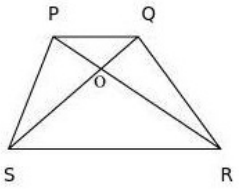
73) In the given figure, ABCD is a rectangle in which CD = 6 cm and AD = 8 cm. Find the area of parallelogram CDBF



74) ABCD is a parallelogram and Q is any point on the side AD. If ar (ΔQBC) = 10cm^2 then find ar(ΔQAB) + ar(ΔQDC)

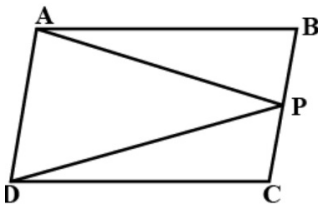


75) In a quadrilateral PQRS, diagonals PR and QS intersect each other at 0 such that ar (ΔPOS) = ar (ΔQOR). If distance between sides PQ and SR is 4 cm, PQ = 3 cm and SR = 7 cm. then find ar (PQRS)



76) XD is a median of MYZ. E is a point on XD such that XE = ED. Find ar (ΔYXD): ar(ΔXEZ)

77) In the given figure, area of parallelogram is 80cm^2. Find

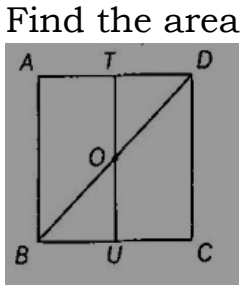


(i) (i) ar (11^{gm} ABEF)
(ii) ar (ΔABD)
(iii) ar (ΔBEF)

78) ABCD is a parallelogram. P is the mid-point of AB. BD and CP intersect at Q such that CQ: QP = 3 : 1. If ar (ΔPBQ) = 10 cm^2. then find the area of parallelogram ABCD.

79) ABC is a triangle in which D is the mid-point of BC. E and F are mid-points of DC and AE, respectively. If area of ΔABC is 16 cm^2, then find the area of ΔDEF.

80) In the following figure, ABCD is a square, and T and U are respectively the mid-points of AD and BC. Find the area of ΔOTD, if AB = 12 cm.

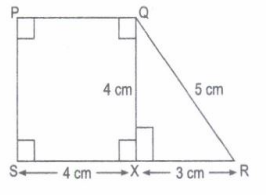


81) In ΔABC, AD is a median and P is a point on AD such that AP: PD = 1 : 3. Find the area of ΔABP.

82) Why we cannot construct a triangle of given sides as 5 cm, 5 cm and 10 cm?

83) In ΔABC, E is the mid-point of median AD, then the ratio of area of ΔBED to the area ΔABC is _____

84) Find the area of trapezium PQRS given in the figure.

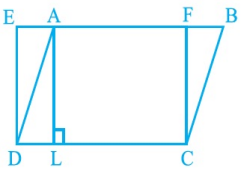


85) Adjacent sides of a rectangle are 16 cm and 8 cm. Find the area of the rectangle.

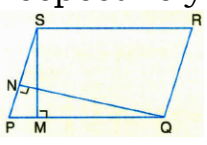
86) A pair of parallel sides of a parallelogram measure 10 cm each. The perpendicular distance between them is 6 cm. What is the area of the parallelogram?

2 Marks 54 x 2 = 108

87) ABCD is a parallelogram and EFCD is a rectangle.
Also, AL $\perp$ DC. Prove that
(i) ar (ABCD) = ar (EFCD)
(ii) ar (ABCD) = DC x AL

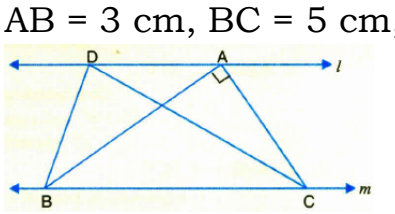


88) In the figure, PQRS is a parallelogram with PQ = 12 cm, altitudes corresponding to PQ and SP are respectively 8 cm and 10 cm. Find SP.

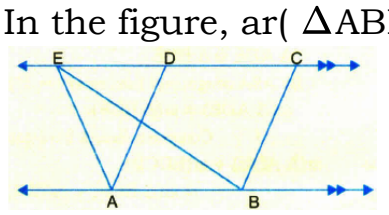


89) In a parallelogram ABCD, AB = 8 cm. The altitudes corresponding to sides AB and AD are respectively 4 cm and 5 cm. Find measure of AD.

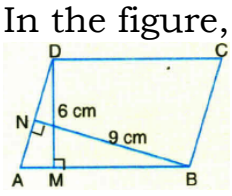
90) In the given figure, ABC and DBC are triangles on the same base and between parallel lines I and m. If AB = 3 cm, BC = 5 cm, $\angle A = 90^\circ$, find area of Δ DBC.



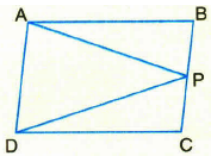
91) In the figure, ar(ΔABE) = 50 cm^2. Find the area of the parallelogram ABCD. Give reasons.



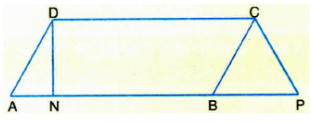
92) In the figure, ABCD is a parallelogram. AB = 12 cm, DM = 6 cm and BN = 9 cm. Find the length of AD.



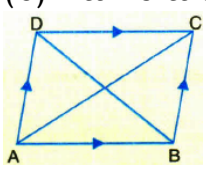
93) If the area of parallelogram (shown in figure) is 80 cm^2 , then find area of Δ ADP.



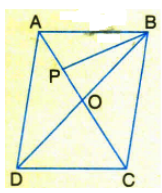
94) In the figure, ABCD is a parallelogram. P is a point on AB produced and $DN \perp AB$. If AB = 8 cm and DN = 3 cm. Find the area of Δ CPD.



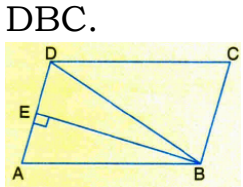
95) In the given figure:
(a) name the two triangles on the same base AB and between the same parallels.
(b) name a triangle and a parallelogram on the same base BC and between the same parallels.



96) ABCD is a parallelogram with area 80 sq. cm. The diagonals AC and BD intersect at O. P is the midpoint of OA. Calculate ar(Δ BOP)



97) In the given figure, ABCD is a $BE \perp AD$parallelogram. If BE = 14 cm and AD = 8 cm, find the area of Δ DBC.

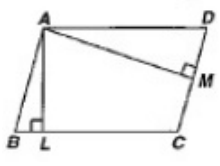


98) In the given figure, area of rectangle EFGH is 400 cm^2 . If L is any point on EF, then find the area of ΔLGH.

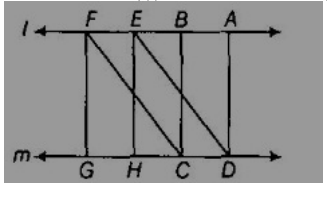
99) If the area, base and corresponding altitude of a parallelogram are x^2, x - 3 and x + 4 respectively, then find the value of x.

100) A rectangle and a parallelogram are on the same base and between same parallels. If the height of parallelogram is 4 cm and the length of base of rectangle is 8 cm, then find the area of parallelogram.

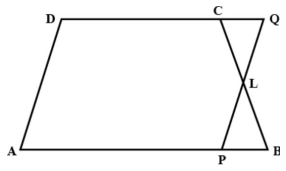
101) In the given fiqure, ABCD is a parallelogram AL$\perp$BC, AM$\perp$CD, AL=4cm and AM=5cm. If BC=6.5c, then find the value of CD.



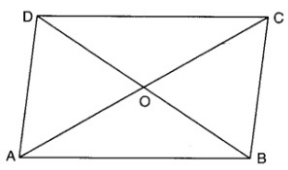
102) In the given figure, if l $\parallel$ m and quadrilaterals ABCD, CDEF and EFGH are parallelograms, then prove that $ar(\parallel^{gm} ABCD) = ar(\parallel^{gm} EFGH)$



103) In trapezium ABCD, AB $\parallel$ DC and L is mid-point of BC. Through L., a line PQ$\parallel$AD has been drawn which meets AB in P and DC produced in Q. Prove that ar(ABCD) = ar(APQD)



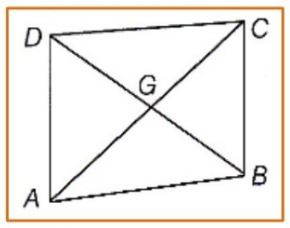
104) 1ABCD is a parallelogram and 0 is the point of intersection of its diagonals (see the figure). If ar(ΔAOD) = 4cm^2 , then find ar(ΔAOB)



105) ΔPQR is an equilateral triangle with PM$\perp$QR. show that ar(ΔPQM)=ar(ΔPRM)

106) ABCD is a parallelogram. X and Yare the mid-points of BC and CD, respectively. Prove that $ar(\triangle xy) = \frac{3}{8} ar \parallel^{gm} ABCD)$

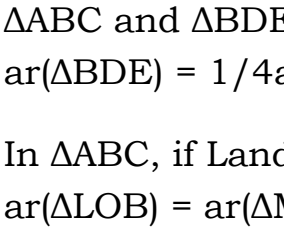
107) In the given figure, it is given that AD ||BC. Prove that ar(ΔCGD) = ar(ΔABG)



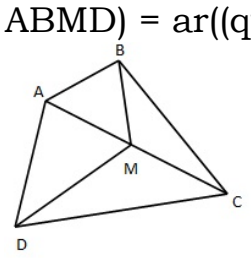
108) PQRS is a trapezium having PS and QR as parallel sides. A is any point on PQ and Bis a point on SR such that AB ||QR. If area of ΔPBQ is $17cm^2$, then find the area of ΔASR.

109) In the given figure, D is the mid -point of side AB of the ΔABC E is the mid -point of CD and F is the mid-point of AE. Prove that 8 x ar(ΔAFD) = ar(ΔABC)

110) In the given figure, X and Yare the mid-points of AC and AB respectively, QP||BC and CYQ and BXP are stright lines. Prove that ar(ΔABP) = ar(ΔACQ)



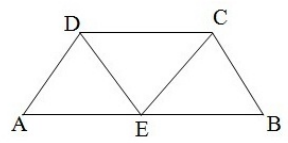
111) In a quadrilateral ABCD, it is.,being given that M is the mid-point of AC. Prove that ar(quadrilateral ABMD) = ar((quadrilateral DMBC)



112) ABCD is a parallelogram and X is the mid-point of AB. If ar (ΔADC) = 24 cm^2, then find ar (AXCD).

113) The medians BE and CF of a ΔABC intersect at G. Prove that ar(ΔGBC) = ar(quadrilateral AFGE)

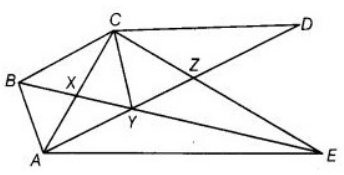
114) ABCD is a trapezium with E being any point on side AB. If AD II EC and DE II BC, then the ratio ar(ΔDE): ar(ΔBEC)



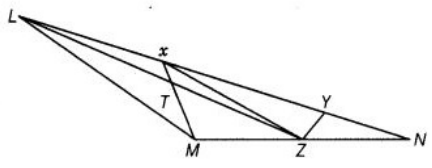
115) ΔABC and ΔBDE are two equilateral triangles such that Dis the mid-point of BC. Then , prove that ar(ΔBDE) = 1/4ar(ΔABC)

116) In ΔABC, if Land M are the points on AB and AC, respectively such that LM II BC, then prove that ar(ΔLOB) = ar(ΔMOC), where O is point of intersection of MB and LC.

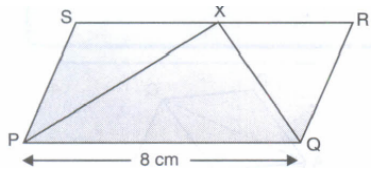
117) In the following figure, CD II AE and CY II BA. Prove that ar (ΔCBX) = ar (ΔAXY).



118) x and Yare points on the side LN of the ΔLMN such that LX = XY = YN. Through X. a line drawn parallel to LM to meet MN at Z (see the figure). Prove that ar(ΔLZY) = ar(quadrilateral Mzyx)



119) In the figure, PQRS is parallelogram with PQ=8 cm and ar(ΔPXQ)=32 cm^2. Find the altitude of PQRS and hence its area.

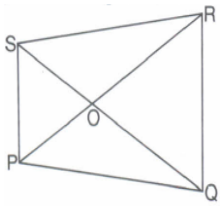


120) ABCD is a rectangle and BD is one of its diagonals. If ar(ΔABD) = $8cm^2$, find ar(Δ BCD).

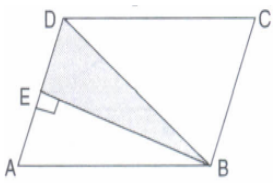
121) ABCD is a quadrilateral and BD is one of its diagonals as shown in figure. Show that ABCD is a parallelogram and find its area.

122) ABCD is a parallelogram with area 80 sq. cm. The diagonals AC and BD intersect at O. P is the mid-point of OA. Calculator ar (ΔBOP).

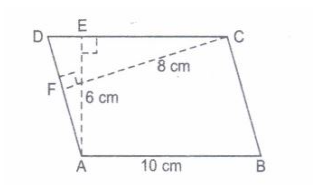
123) In the figure, PS||QR, Show that ar(ΔROS) = ar(ΔPOQ).



124) In given figure, ABCD is a parallelogram and BE$\perp$AD. If BE=14 cm and AD=8 cm, find the area of Δ DBC.

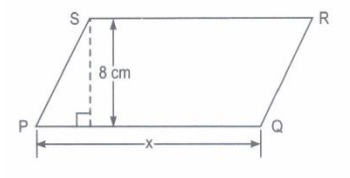


125) In the adjoining figure, ABCD is a parallelogram such that AE $\perp$ DC and CF $\perp$ AD. If AB =10 cm, AE = 6 cm and CF = 8 cm, then find AD.

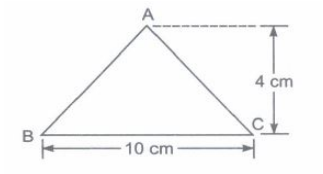


126) PQRS is a square. T and U are respectively, the mid points of PS and QR. Find the area of ΔOTS, if PQ = 8 cm, where O is the point of intersection of TU and OS.

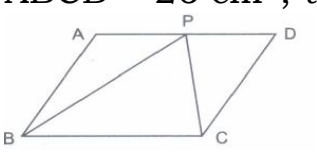
127) The area of the parallelogram PQRS (in the adjoining figure) is 88 cm^2. Find the value of x.



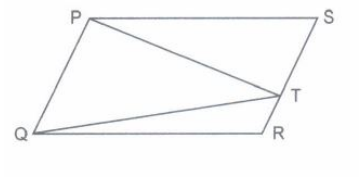
128) Find the area of ΔABC given in the adjoining figure.



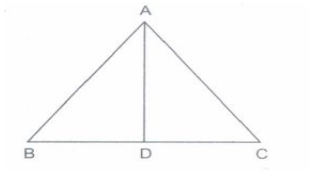
129) In the adjoining figure, ABCD is a parallelogram and BPC is a triangle. If the area of parallelogram ABCD = 26 cm^2, then find the area of triangle BPC.



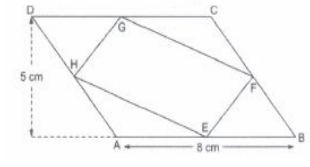
130) In the adjoining figure, PQRS is a parallelogram and PQT is a triangle. If area of triangle PQT = 18 cm^2, then find the area of the parallelogram PQRS.



131) In the adjoining figure. ABC is triangle and AD is a median. If the area of Δ ABD is 15 cm^2, then find the area of Δ ABC.



132) The area of parallelogram ABCD is 40 cm^2. If E, F, G and H are mid-points of AB, BC, CD and AD respectively, then what is the area of EFGH?



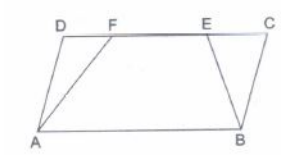
133) The area of a triangle ABC is 15 cm^2. If ΔABC and a parallelogram ABPD are on the same base and between the same parallels, then what is the area of the parallelogram ABPD?

134) A rectangle and a parallelogram are on the same base and between the same parallels. If the area of the rectangle is 30 cm^2 then what is the area of the parallelogram?

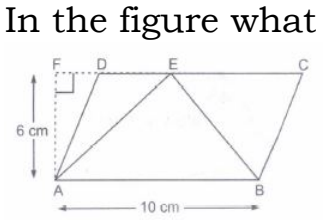
135) The sides of a rectangle are 8 cm and 6 cm. The mid-points of its adjacent sides are joined to form a quadrilateral. What is the area of the quadrilateral so formed?

136) If two parallelograms are on equal bases and between the same parallels, then what is the ratio of their areas?

137) In the figure ar (quad ABEF) = 20 cm^2 and ar(quad ABED) = 27cm^2. What is the area of ΔADF?

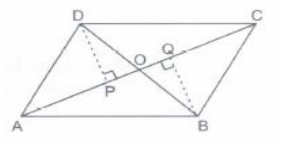


138) In the figure what is the area of ΔABE?



139) Two parallelograms ABCD and PBCS are on the same base BC and between the same parallels BC and AS. If ar(PBCS) = 25 cm^2 then what is ar(ABCD)?

140) If a triangle and a parallelogran are on the same base and between same parallels, then what is the ratio of the area of the triangle to the area of parallelogram?



3 Marks 34 x 3 = 102

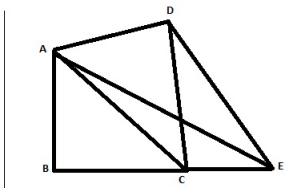
141) P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. Show that ar(Δ APB) = ar(Δ BQC)

142) In a triangle ABC, E is the midpoint of median AD. Show that ar(Δ BED) = $\frac{1}{4}$ ar(Δ ABC).

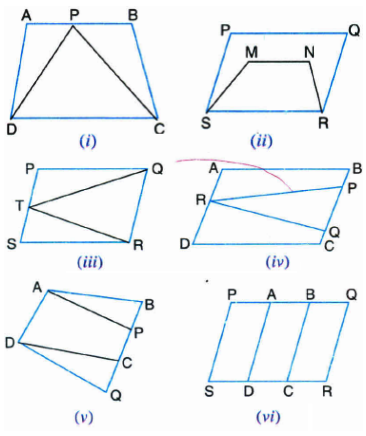
143) Diagonals AC and BD of a quadrilateral ABCD intersect at O in such a way that ar(Δ AOD) = ar(Δ BOC). Prove that ABCD is a trapezium.

144) Diagonals AC and BD of a quadrilateral ABCD intersect each other at P. Show that
$ar(\Delta APB) \times ar(\Delta CPD) = ar(\Delta APD) \times ar(\Delta BPC)$

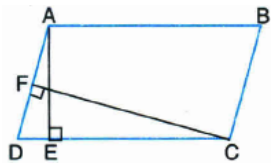
145) ABCD is a quadrilateral and BE || AC and also BE meets DC produced at E. Show that area of D ADE is equal to the area of the quadrilateral ABCD.



146) Which of the following figures lie on the same and between the same parallels.In such a case, write the common base and the two parallels.



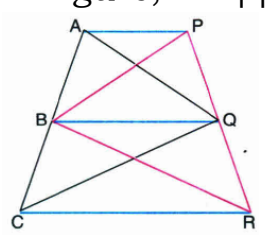
147) In figure, ABCD is a parallelogram, $AE \perp DC$ and $CF \perp AD$. If AB = 16cm, AE = 8 cm and CF = 10 cm, find AD.



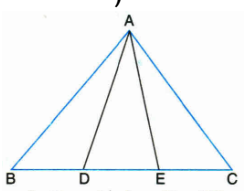
148) A villager Itwaari has a plot of land of the shape of a quadrilateral. The Gram Panchayat of the village decided to take over some portion of his plotfrom one of the corners to construct a Health Centre. Itwaari agrees to the above proposal with the condition that he should be given equal amount of land in lieu of his land adjoining his plot so as to form a triangular plot. Explain how this proposal will be implemented.

149) ABCD is a' trapezium with AB || DC A line parallel to AC intersects AB at X and BC at Y. Prove that ar(Δ ADX) = ar(Δ ACY)

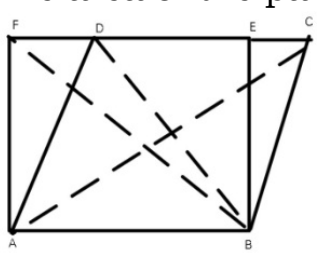
150) In figure, AP || BQ || CR. Prove that ar(ΔAQC) = ar(ΔPBR).



151) In figure, D and E are two points on BC such that BD = DE = EC. Show that ar(ΔABD) = ar(ΔADE) = ar(ΔAEC).



152) The area of the parallelogram ABCD is 90 cm^2 Find

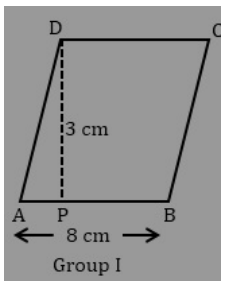


ar (Il^{gm} ABEF)

(ii) ar (ΔABD)

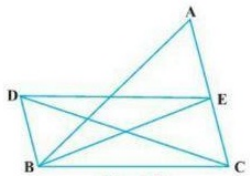
(iii) ar (ΔBEF).

153) In a class, teacher gave two identical cardboard pieces which are in the shape of a parallelogram to two groups. First group was asked to find area of parallelogram using AB as base. Then, another group was asked to find height h of the parallelogram with AD as base. How will they find value of h?



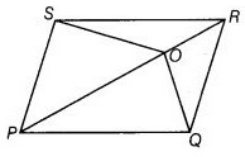
154) PQRS is a rectangle inscribed in a quadrant of a circle of radius 13 cm. A is any point on PQ (see the figure). If PS = 5 cm, then show that ar (ΔPAS)$\leq$ 30cm^2

155) In the given figure, BD$\parallel$CA, E is mid-point of CA and BD=1/2CA. Prove that ar(ΔABC) = 2ar(ΔDC)

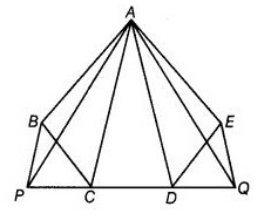


156) In ΔDEF, M and N are mid-points of sides EF and DE, respectively. If ar(IΔENM)= 4 cm^2 find ar(ΔDEF)

157) O is any point on the diagonal PR of parallelogram PQRS (see the figure). Prove that ar (ΔPQO) = ar (ΔPSO)



158) In the adjoining Iiqure. ABCDEis any Pentagon. BP drawn parallel to AC meets DC produced at P and EQ drawn parallel to AD meets CD produced at O. Prove that ar (ABCDE) = ar (ΔAPQ).

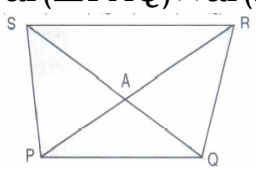


159) A point E is taken on the side BC of a parallelogram ABCD. AE and DC are produced to meet at F. Prove that ar(ΔADF)=ar(quadrilateral ABFC)

160) The medians of a ΔABC intersect each other at point G. If one of its median is AD, then prove that
(i) ar (ΔABD) = 3 x ar (ΔBGD)
(ii) ar (Δ ACD) = 3 x ar (ΔCGD)
(ii) ar(ΔBGC) = 1/3 x ar(ΔABC)

161) MNOP is a parallelogram and PN is one of its diagonals show that ar(ΔPMN) = ar(ΔPON).

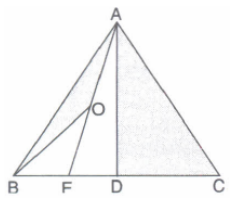
162) Diagonals PR and QS of quarilateral PQRS intersect each other at A.Show that: ar(ΔPSA)×ar(ΔQAR) = ar(ΔPAQ)×ar(ΔSAR)



163) If a parallelogram and a triangle are on the same base and between the same parallels, then prove that area of a triangle is equal to half the area of a parallelogram.

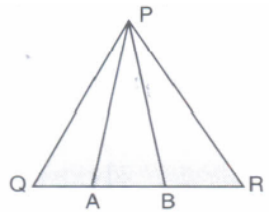
164) In the figure, ar (ΔDRC) = ar(Δ DPC) and ar(ΔBDP) = ar(ΔARC). Show that both the quarilaterals ABCD and DCPR are trapeziums.

165) D is the mid-point of side BC of △ABC and E is the mid-point of BD. If O is the mid-point of AE, then prove that ar(△BOE) = $\frac{1}{8}ar(\triangle ABC)$

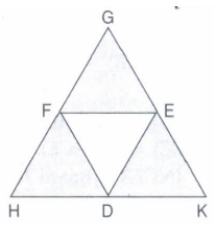


166) In the figure, AP || BQ || CR. Prove that ar(AQC) = ar(PBR).

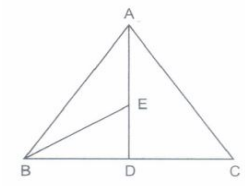
167) In ΔPQR, A and B are points on sides QR such that they trisect QR, Prove that: ar(ΔPQB) = 2ar (ΔPBR)



168) In ΔGHK; D, E and F are the mid-point of sides HK, KG and GH respectively. show that EFHK is trapezium and ar(EFHK) = $\frac{3}{4}ar(\Delta GHK)$

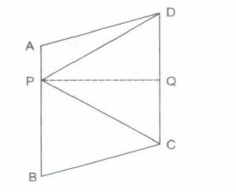


169) The area of Δ ABC, in the adjoining figure, is 32 cm^2, AD is a median and E is the mid-point of AD. Find the area of ΔBED.

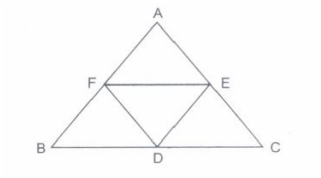


170) In the adjoining figure, the area of ΔBCE is 21 cm^2, If CD = 6 cm, then find the length of AF.

171) In the adjoining figure, the area of a parallelogram ABCD is 40 cm^2, If PQ is a median of ΔCDP then, find the area of ΔPDQ.



172) In the adjoining figure, ABC is a triangle having area as 24 cm^2, Find the area of
(i) ΔEFD and
(ii) parallelogram BDEF such that E, F and D are the mid-points of sides CA, AB and B,C respectively.

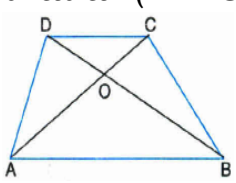


173) If two sides oj one triangle are equal to the two sides of another triangle and the contained angles are supplementary; show that the two triangles are equal in area.

174) In a trapezium ABCD, where AB II DC, E is the mid point of BC. Prove that ΔAED = 1/2 trap. ABCD.

4 Marks 43 x 4 = 172

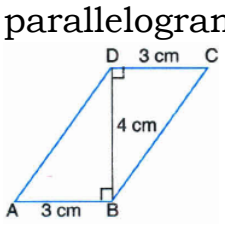
175) In the figure, diagonals AC and BD of a trapezium ABCD with AB || CD intersect each other at O. Show that ar (Δ AOD)= ar(Δ BOC).



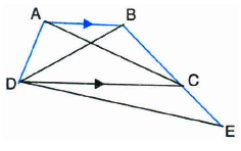
176) Parallelograms on the same base and between same parallels are equal in area. Prove this.

177) Show that a median of a triangle divides it into two triangles of equal areas.

178) ABCD is a quadrilateral and BD is one of its diagonals as shown in figure. Show that ABCD is a parallelogram and find its area.

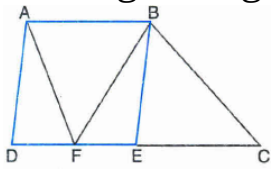


179) In the given figure, AB 11DC. Show that ar(BDE) = ar(ACED).



180) Areas of triangles on the same bases and between the same parallels are equal in. Prove it.

181) In the given figure, ABED is a parallelogram in which DE = EC. Show that: area (ABF) = area (BEC).



182) Prove that the area of a trapezium is equal to half of the product of its height and sum of parallel sides.

183) Prove that of all parallelograms of which the sides are given, the parallelogram which is a rectangle, has the greatest area.

184) The diagonals of a parallelogram ABCD intersect at a point O. Through O, a line is drawn to intersect AD at P and BC at Q. Show that PQ divides the parallelogram into two parts of equal area.

185) Prove that the area of a rhombus is equal to half the rectangle contained by its diagonals.

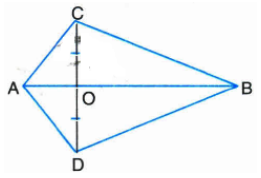
186) Given two points A and B and a positive real number k. Find the locus of a point P such that ar(Δ PAB) = k.

187) Show that the line segment joining the mid-points of a pair of opposite sides of a parallelogram divides it into two equal parallelograms.

188) BD is one of the diagonals of a quadrilateral AB CD. AM and CN are the perpendiculars from A and C respectively on BD. Show that
$ar(ABCD) = \frac{1}{2}BD.(AM + CN)$.

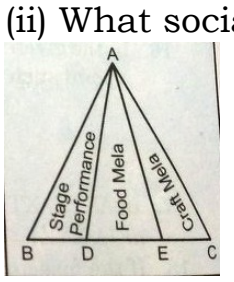
189) ABCD is a parallelogram whose diagonals intersect at o. If P is any point on BO, prove that
(i) ar(ΔADO) = ar(Δ CDO)
(ii) ar(ΔABP) = ar(Δ CBP)

190) ΔABC and Δ ABD are two triangles on the same base AB. If line segment CD is bisected by AB at O, show that ar (Δ ABC) = ar (ΔABD)

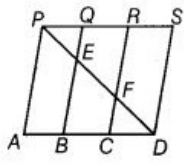


191) Triangles ABC and DBC are on the same base BC with vertices A and D on opposite sides of BC such that ar (ΔABC) = areΔ DBC). Show that BC bisects AD.

192) A resident welfare association of some society decides to use a triangular part of the compound of society for celebrating all cultural and national festivals together. The triangular area used is shown in the figure.
(i) If BC is trisected by points D and E, then show that areas allotted for stage performance, food mela and craft mela are equal.
(ii) What social value is depicted from the above situation?

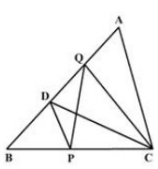


193) In the adjoining figure, PSDA is a parallelogram. Points 0 and R are taken on PSsuch that PO = OR = RS and PA II QB II RC Prove that ar (ΔPQE) = ar (ΔCFD).



194) ABCD is a trapezium in which AB II DC, DC = 30 cm and AB = 50 cm. If X and Y are respectively the mid-points of AD and BC, then prove that $ar(DCYX) = \frac{7}{9}(XYBA)$

195) In the adjoining figure, ABC is a triangle and Dis the mid-point of AB. P is any point on Be. Line CO is drawn parallel to PD to intersect AB at O. PO is joined. Show that ar(ΔBPQ) = 1/2ar(ΔABC)



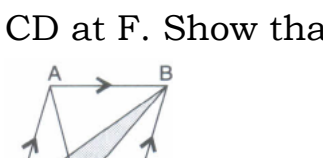
196) For 'Sarva Shiksha Abhiyan' a rally was organised by a school. Students were given triangular cardboard pieces to write slogans. They divided the triangular shape into three equal parts by drawing medians.
(i) Prove that ar (ΔAGB) = ar (ΔAGC) = ar (ΔBGC) = 1/3 ar (ΔABC)
(ii) Which value is depicted through this activity?

197) In order to guide and help people to reach school without any problem, being faced in finding the way to school, students of the school decided to put up a sign board based on main road. The sign board ABCD is in shape of a parallelogram as shown in figure.
(i) If X and Y are respectively the mid-points of sides AB and CD respectively, show that ar (AXYD) = ar(BXYC)
(ii) What can you say about this gesture of the students?

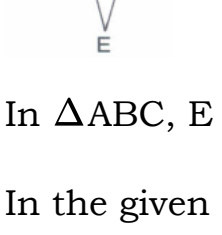
198) Prove that the diagonals of a rectangle are equal in length.

199) ABCD is a quadrilateral with BD as one of its diagonals and AB = CD=2.5 cm, $\angle ABD = \angle CDB$ = 90 ° and DB = 4 cm. Show that quad. ABCD is a parallelogram and find its area.

200) ABCD is a rectangle. E, F, G and H are mid-point of sides AB. BC, CD and DA, respectively. If ar(EFGH)=16 cm^2, find ar (ABCD).

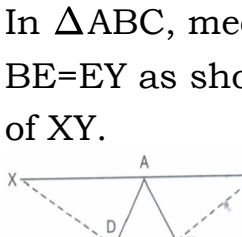


201) PQRS is square. N and M are the mid-points of sides SR and QR respectively. O is a point on diagonal PR such that OP = OR. Show that ONRM is a square. Also find the ratio of ar (ΔORM) and ar(PQRS).



202) PQRS is a parallelogram and O is a point in the interior of the parallelogram. Show that ar(POS) + ar(QOR)=$\frac{1}{2}ar(PQRS)$.

203) ABCD is parallelogram as shown is figure. O is any point on AC. PQ||AB and LM||AD. show that ar(DLOP)=ar(BMOQ).



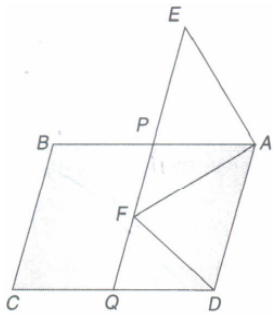
204) In the figure, ABCD is a parallelogram in which BC is produced to E such that CE=BC. AE intersects CD at F. Show that ar(ΔBDF)=$\frac{1}{4}$ar (ABCD).

205) In ΔABC, E is the mid-point of median AD. show that ar(ΔBED) = $\frac{1}{4}ar(\Delta ABC)$

206) In the given figure, ABC and DBC are triangle on the same base and between the parallel lines l and m. If AB = 3 cm, BC=5 cm, $\angle$A=90°, find the area of ΔDBC.

207) In ΔABC, medians BE and CD are produced respectively to points X and Y such that CD=DX and BE=EY as shown in figure. Show the points X, A and Y are collinear. Also, show that A is the mid-point of XY.

208) In the given figure ABCD and AEFD are two parallelograms. Prove that ar(ΔPEA)=ar(ΔQFD).

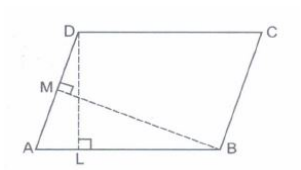


209) Two brothers have a triangular plot. They decide to distribute it equally amongst themselves but also want to give away a triangular part of it for charity to a school which is attached on the base side of 120 m of the triaangular plot.
Answer the following questions:
(i) what is the area of the triangular plot if its height is 90 m?
(ii) Explain with the help of figure how could this be possible and what type of parts do the brothers get?
(iii) What value of the two brothers is depicted here?

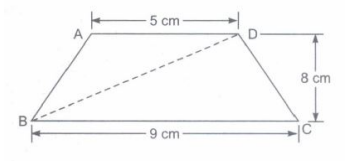
210) Mr. Sharma explains his four children two boys and two girls, distribution of his property among them by a picture of ΔABC such that D, E, F are mid-points of sides AB, BC, CA respectively and are joined to divide ΔABC in four triangles as shown in figure.
(i) If total property is equal to the area of ΔABC and share of each child is equal to the area of each of four triangles, calculate the share of each child.
(ii) Which mathematical concept is used in it?
(iii) Which values are depicted in Mr Sharma's plan?

211) A villager had a plot of land in the shape of a quadrilateral. The Gram Panchayat decided to take come portion of his plot from one of the corners to construct a Health Centre. He reluctantly agrees but with a condition that he will be given equal amount of land in lieu of his plot so as to form a triangular plot.
Answer the following questions:
(i) Explain how could this be implemented with figure?
(ii) what value of the villager is depicted hare?
(iiii) Do you thick constructing a Health Centre in the village is justified.If so, why?

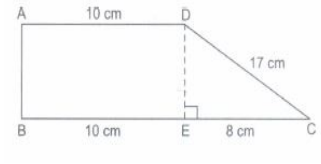
212) In a parallelogram ABCD, it is being given that AB = 12 cm and the altitude corresponding to the sides AB and AD are DL = 5 cm and BM = 8 cm respectively. Find AD.



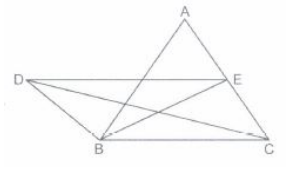
213) Find the area of a trapezium whose parallel sides are 9 cm and 5 cm respectively and the distance between these sides is 8 cm.



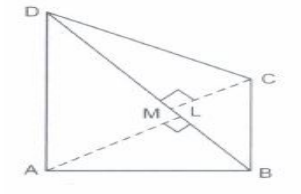
214) In the adjoining figure, find the area of the trapezium ABCD.



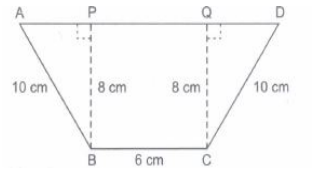
215) In the figure BD II CA, E is mid-point of CA and BD = $\frac{1}{2}$ CA. Prove that ar (ΔABC) = 2 ar (ΔDBC)



216) In the adjoining figure, ABCD is a quadrilateral in which diagonal BD = 12 cm. If AL ⊥ BD and CM ⊥ BD sueh that AL = 6 cm and CM = 4 cm, find the area of quadrilateral ABCD.



217) Find the area of the following quadrilateral.



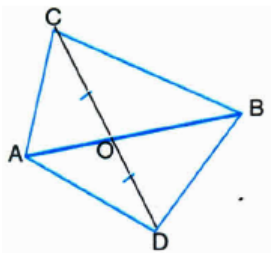
5 Marks 42 x 5 = 210

218) If E, F, G and H are respectively the mid-points of the sides of a parallelogram ABCD, show that $ar(EFGH) = \frac{1}{2}ar(||^{gm} ABCD)$

219) A farmer was having a field in the form of a parallelogram PQRS. He took any point A on RS and joined it to points P and Q. In how many parts, the field is divided? What are the shapes of these parts? The farmer wants to sow wheat and pulses in equal portions of the field separately. How should he do it?

220) Show that the diagonals of a parallelogram divide it into four triangles of equal areas

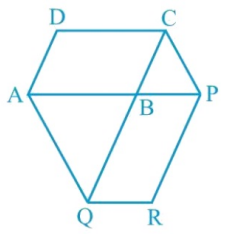
221) In the given figure, ABC and ABD are two triangles on the same base AB. If line segment CD is bisected by AB at 0, then show that ar(ΔABC) = ar(ΔABD)



222) D and E are points on sides AB and AC, respectively of ΔABC such that ar(ΔDBC) = ar(EBC) prove that DE∥BC

223) XY is a line parallel to side BC of a ΔABC. If BE∥AC and CF∥AB meet XY a E and F respectively, then show that ar(ΔABE) = ar(ΔACF)

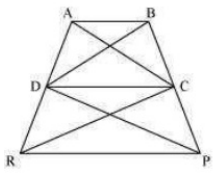
224) The side AB of a parallelogram ABCD is produced to any point P. A line through A and parallel to CP meets CB produced at Q and then parallelogram PBQR is completed (see the figure).



Show that $ar(||^{gm} ABCD) = ar(||^{gm} PBQR)$
[Hint Join AC and PQ. Now, compare ar(ΔACQ) and ar(ΔAPQ)]

225) A villager Itwaari has a plot of land of the shape of a quadrilateral. The Gram Panchayat of the village decided to take over some portion of his plot from one of the corners to construct a Health Center. Itwaari agrees to the above proposal with the condition that he should be given equal amount of land in lieu of his land adjoining his plot so as to form a triangular plot. Explain how this proposal will be implemented?

226) In the following figure, ar (ΔDRC)= ar (ΔDPC) and ar (ΔBDP = ar (ΔARC). Show that both the quadrilaterals ABCD and DCPR are trapeziums.



227) Parallelogram ABCD and rectangle ABEF are on the same base AB and have equal areas. Show that the perimeter of the parallelogram is greater than that of the rectangle.

228) In the adjoining figure, ABC and BDE are two equilateral triangles such that D is the mid-point of Be. If AE intersects BC at F, then show that

(i) ar (ΔBDE) = 1/2 ar (ΔBAE)

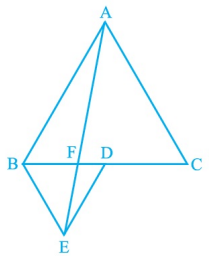
(ii) ar (ΔABC) = 2 ar (ΔBEC)

(iii) ar (ΔBFE) = ar (ΔAFD)

(iv) ar (ΔBFE) = 2 ar (ΔFED)

(v) ar (ΔFED)= 1/8 ar (ΔAFC)

(vi) ar (BDE) = 1/4 ar (ABC)



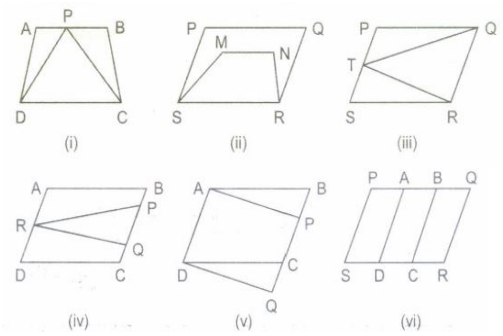
229) If P and Q are respectively the mid -points of sides AB and BC of a triangle ABC and R is the mid-point of AP, then show that

(i) ar (ΔPRQ) = 1/2 ar (ΔARC).

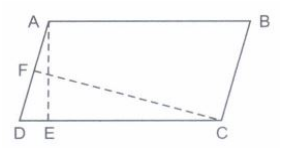
(ii) ar (ΔRQC) = 1/2 ar (ΔABC).

(iii) ar (ΔPBQ) = ar (ΔARC).

230) Which of the following figures lie on the same base and between the same parallels. In such a case, write the common base and the two parallels.



231) In the figure, ABCD is a parallelogram, AE ⊥ DC and CF ⊥ AD. If AB = 16 cm, AE = 8 cm and CF = 10 cm, find AD.

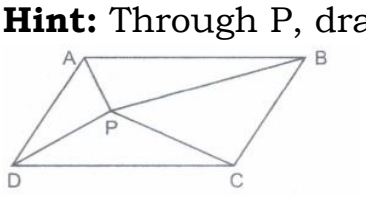


232) In the figure, P is a point in the interior of a parallelogram ABCD. Show that

(i) ar (ΔAPB) + ar (ΔPCD) = $\frac{1}{2}$ ar (ABCD)

(ii) ar (ΔAPD) + ar (ΔPBC) = ar (ΔAPB) + ar (ΔPCD)

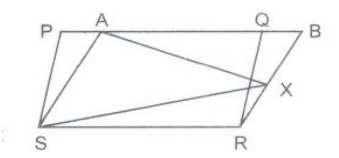
Hint: Through P, draw a line parallel to AB.



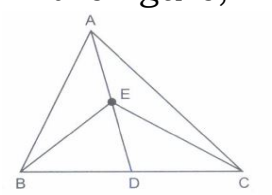
233) In the figure, PQRS and ABRS are parallelograms and X is any point on side BR. Show that

(i) ar (PQRS) = ar (ABRS)

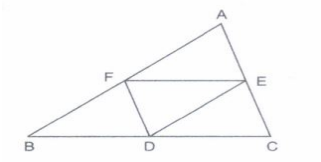
(ii) ar (AXS) = $\frac{1}{2}$ar (PQRS)



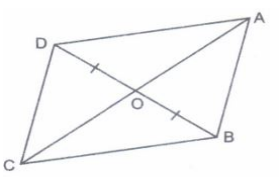
234) In the figure, E is any point on median AD of a ΔABC. Show that ar (ABE) = ar (ACE).



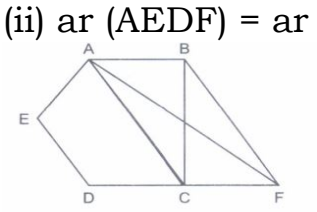
235) D, E and F are respectively the mid-points of the sides BC, CA and AB of a ΔABC. Show that
(i) BDEF is a parallelogram.
(ii) ar (DEF) = $\frac{1}{4}$ar (ABC)
(iii) ar (BDEF) = $\frac{1}{2}$ar (ABC)



236) In the figure, diagonals AC and BD of a quadrilateral ABCD intersect at O such that OB = OD. If AB = CD, then show that
(i) ar (DOC) = ar (AOB)
(ii) ar (DCB) = ar (ACB)
(iii) DA II CB or ABCD is a parallelogram.
Hint: From D and B, draw perpendiculars to AC.



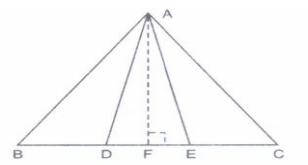
237) In the figure, ABCDE is a pentagon. A line through B parallel to AC meets DC produced at F Show that
(i) ar (ACB) = ar (ACF)
(ii) ar (AEDF) = ar (ABCDE)



238) ABCD is a trapezium with AB II DC. A line parallel to AC intersects AB at X and BC at Y. Prove that ar (ADX) = ar (ACY).
Hint: Join CX.

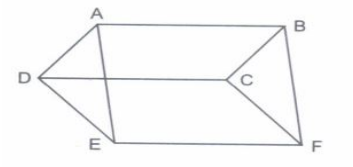
239) In the figure, AP II BQ II CR. Prove that ar (AQC) = ar (PBR).

240) In the figure, D and E are two points on BC such that BD = DE = EC. Show that ar (ABD) = ar (ADE) = ar (AEC) Can you now, answer the question that you have left in the 'Introduction' of this chapter, whether the field of Budhia has been actually divided into three parts of equal area?

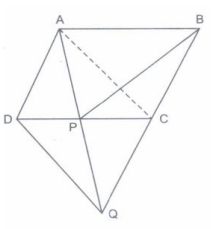


Remark
Note that by taking BD = DE = EC, the triangle ABC is divided into three triangles ABD, ADE and AEC of equal areas. In the same way, by dividing BC into n equal parts and joining the points of division so obtained to the opposite vertex of BC, you can divide MBC into n triangles of equal areas.

241) In the figure, ABCD, DCFE and ABFE are parallelograms. Show that ar(ADE) = ar (BCF).



242) In the figure ABCD is a parallelogram and BC is produced to a point Q such that AD = CQ. If AQ intersect DC at P, show that ar (BPC) = ar (DPQ).
Hint: Join AC.



243) In the figure, ABC is a right triangle right angled at A. BCED, ACFG and ABMN are squares on the sides BC, CA and AB respectively. Line segment AX ⊥ DE meets BC at Y. Show that:

(i) ΔMBC ≅ ΔABD

(ii) ar (BYXD) = 2ar (ΔMBC)

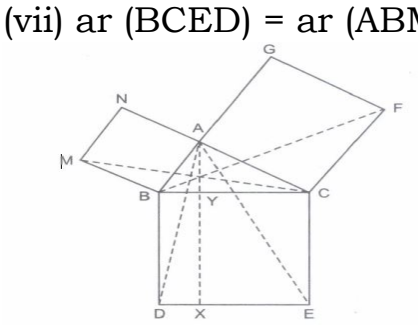
(iii) ar (BYXD) = ar (ABMN)

(iv) ΔFCB ≅ ΔACE

(v) ar (CYXE) = 2ar (Δ FCB)

vi) ar (CYXE) = ar (ACFG)

(vii) ar (BCED) = ar (ABMN) + ar (ACFG)

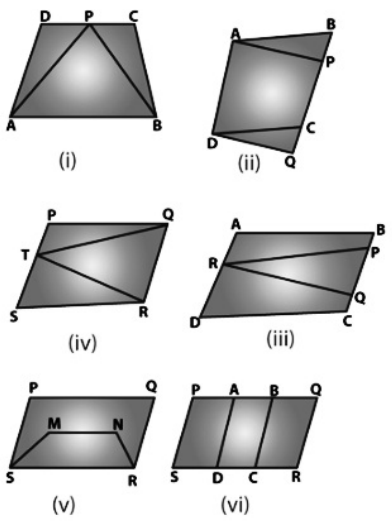


Note: Result (vii) is the famous Theorem of Pythagoras. You shall learn a simpler proof of this theorem in Class X.

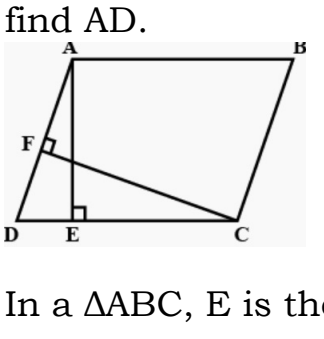
244) If a triangle and a parallelogram are on the same base and between the same parallels, then prove that the area of the triangle is equal to half the area of the parallelogram.

245) Two triangles on the same base (or equal bases) and between the same parallels are equal in area.

246) Which of the following figures lie on the same base and between the same parallels? In such a case, write the common base and the two parallels.

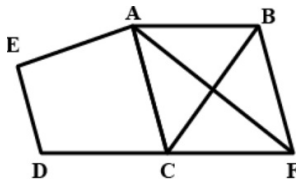


247) In the given figure, ABCD is a parallelogram, AE⊥AD. If AB = 16 cm, AE = 8 cm and CF=10 cm, then find AD.



248) In a ΔABC, E is the mid-point of median AD. Show that $ar(\triangle BED) = \frac{1}{2}ar(\triangle ABC)$

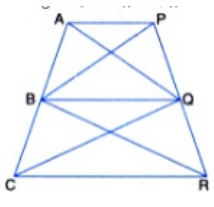
249) In the given figure, ABCDE is a pentagon. A line through B parallel to AC meets DC produced at F. Show that



(i) ar(ΔACB) = ar(ΔACF)

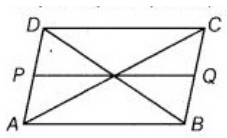
(ii) ar(AEDF) = ar(ABCDE)

250) In the following figure, AP II BQ II CR. Prove that ar (ΔAQC) = ar (ΔPBR).



251) Diagonals AC and BDof a quadrilateral ABCD intersect at O in such a way that ar (ΔAOD) = ar (ΔBOC). Prove that ABCD is a trapezium.

252) The diagonals of a parallelogram ABCD intersect at point O. Through 0, a line is drawn intersect AD at Pand BC at Q. Show that PO divides the parallelogram into two parts of equal areas.



253) ABCD is a trapezium with parallel sides AB = a cm and DC = b cm. E and F are the mid-points of the non-parallel sides. Find the ratio of ar (ABFE) and ar (EFCD).

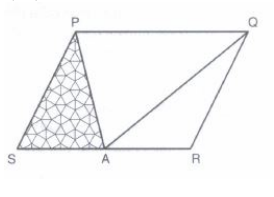
254) P' and 'Q' are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. Show that ar (ΔAPB) = ar(ΔBQC).

255) A farmer was having a field in the form of a parallelogram PQRS. He divides it into three parts ΔPSA, ΔPAQ and ΔQAR such that AS = AR. He sows wheat in the triangular part PSA and donates the product to an orphanage.

(a) What part of the parallelogram PQRS is the triangular field PSA?

(b) Which mathematical concept is used in the above problem?

(c) By donating wheat product to an orphanage which value is depicted by the farmer?

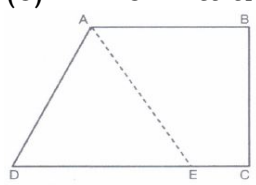


256) A villager Itwari has a plot of land in the shape of a quadrilateral ABCD. The Gram Panchayat of the village plan to take over a portion of his plot from one of the corners to construct a charitable Health-Centre. Itwari agrees to the above proposal with a condition that he should be given equal amount of land in lieu of his land adjoining his plot so as to form a triangular plot.

(a) Explain how the above proposal will be implemented?

(b) Which mathematical concept has been covered in the above problem?

(c) Which values are depicted in the above plan?



257) Ranjeet was having a field in the form of a parallelogram PQRS. He divides it into three parts by taking 'A' on RS and joining it to 'P' and 'Q'. Such that:

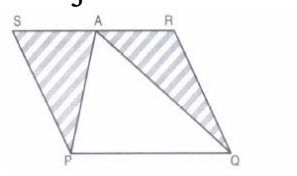
(i) One part is exactly half of the given field.

(ii) In the remaining two parts, he wants to sow wheat and pulses separately and donates their products to an orphanage.

(a) How the above plan can be implemented?

(b) Which mathematical concept is used in this problem?

(c) By donating the product of two parts wheat + pulses to an orphanage, which value is depicted by Ranjeet?



258) Rahul has a triangular plot ABC He wants to divide it into 4 equal triangular parts. He donates one of the triangular part containing the vertex 'A ' to residents welfare society for constructing a charity health centre unit.

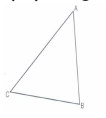
(a) How the above plan can be implemented?

(b) What is the ratio of the donated part to remaining part of the plot?

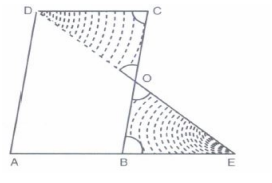
(c) Do the remaining three parts taken together form a trapezium? If yes, then name it.

(4 Which mathematical concept is used in this problem?

(e) By donating a part of his plot for a charitable health centre, which value is depicted by Rahul?



259) Praful has a piece of land ABCD which is in the form of a parallelogram. Ashok has a plot (triangular in shape) BOE adjoining to Praful s land, such that AB = BE and BO = CO.
A welfare society plan to open an Adult-Education Centre in Ashok's plot. Ashok agrees to exchange it with another triangular plot of same area. Praful allows to donate a triangular piece along DC to be exchanged with Ashok's plot.
(a) How the above plan can be implemented?
(b) Which mathematical concept is involved in the above problem?
(c) By helping the welfare society in making its plan feasible, A which values are depicted by Ashok and Praful?



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