MINIMUM STUDY MATERIAL FOR QUARTERLY EXAM

10th Standard

Maths

100 x 2 = 200

1) Find A x B, A x A and B x A
A = {2, -2, 3} and B = {1,-4}

2) Let A = {1,2,3} and B = {x| x is a prime number less than 10}. Find A x B and B x A.

3) A Relation R is given by the set {(x,y) / y = x + 3, x $\in$ {0, 1, 2, 3, 4, 5}}. Determine its domain and range.

4) Let X = {1, 2, 3, 4} and Y = {2, 4, 6, 8,10} and R = {(1, 2),(2, 4),(3, 6),(4, 8)} Show that R is a function and find its domain, co-domain and range?

5) Let f(x) = 2x + 5. If x ≠ 0 then find $\frac{f(x+2)-f(2)}{x}$.

6) If A = {-2, -1, 0, 1, 2} and f: A ⟶ B is an onto function defined by f(x) = x^2 + x + 1 then find B.

7) Let f be a function f : N ⟶ N be defined by f(x) = 3x + 2, x $\in$ N
(i) Find the images of 1, 2, 3
(ii) Find the pre-images of 29, 53
(iii) Identify the type of function

8) Let A = {1, 2, 3, 4} and B = N. Let f: A ⟶ B be defined by f(x) = x^3 then
(i) find the range of f
(ii) identify the type of function

9) Find f o g and g o f when f(x) = 2x + 1 and g(x) = x^2 - 2

10) If f(x) = 3x - 2, g(x) = 2x + k and if f o g = f o f, then find the value of k..

11) If f(x) = 2x + 3, g(x) = 1 - 2x and h(x) = 3x. Prove that f o(g o h) = (f o g) o h.

12) ' a ' and ' b ' are two positive integers such that $a^b \times b^a = 800$. Find ' a ' and ' b'

13) If 13824 = $2^a \times 3^b$ then find a and b.

14) Solve 8x ≡ 1 (mod 11)

15) Compute x, such that 10^4 ≡ x (mod 19)

16) Solve 3x - 2 ≡ 0 (mod 11)

17) The general term of a sequence is defined as

$$a_n = \begin{cases} n(n+3); n \in N \quad is \quad odd \\ n^2 + 1; n \in N \quad is \quad even \end{cases}$$

Find the eleventh and eighteenth terms.

18) Find the first five terms of the following sequence,

$a_1 = 1$, $a_2 = 1$, $a_n = \frac{a_{n-1}}{a_{n-2}+3}; n \geq 3, n \in N$

19) if $a_1 = 1$, $a_2 = 1$ and $a_n = 2a_{n-1} + a_{n-2}$ $n \geq 3$, $n \in N$, then find the first six terms of the sequence

20) Find the 15^{th}, 24^{th} and n^{th} term (general term) of an A.P. given by 3, 15, 27, 39

21) Find the 19^{th} term of an A.P. -11, -15, -19,....

22) Which term of an A.P. 16,11,6,1,... is -54?

23) Find the middle term(s) of an A.P 9, 15, 21, 27,.....,183.

24) If 3 + k, 18 - k, 5k + 1 are in A.P. then find k.

25) Find the sum of first 15 terms of the A.P. $8, 7\frac{1}{4}, 6\frac{1}{2}, 5\frac{3}{4}, \ldots$.

26) In an A.P. the sum of first n terms is $\frac{5n^2}{2} + \frac{3n}{2}$. Find the 17^{th} term

27) Find the sum of first 28 terms of an A.P. whose n^{th} term is 4n - 3.

28) Find the 8^{th} term of the G.P 9,3,1,....

29) Find the number of terms in the following G.P.

4, 8,16,...,8192

30) Find the sum of 8 terms of the G.P. 1, -3, 9, -27....

31) How many terms of the series 1 + 4 + 16 + ...make the sum 1365?

32) Find the sum $3 + 1 + \frac{1}{3} + \ldots \infty$

33) Find the value of

1 + 2 + 3 + ...+ 50

34) Find the sum of

1 + 3 + 5 +..+ to 40 terms

35) Find the sum of

$1^2 + 2^2 + \ldots + 19^2$

36) Find the sum of

$1^3 + 2^3 + 3^3 + \ldots + 16^3$

37) If 1+ 2 + 3 +...+ n = 666 then find n.

38) If 1 + 2 + 3 +...+ k = 325, then find $1^3 + 2^3 + 3^3 + \ldots K^3$.

39) If $1^3 + 2^3 + 3^3 + \ldots k^3 = 44100$ then find 1 + 2 + 3 +...+ k

40) Find the least positive value of x such that

$98 \equiv (x + 4) \pmod 5$

41) Find the least positive value of x such that

$5x \equiv 4 \pmod 6$

42) Find the first four terms of the sequences whose nth terms are given by

$a_n = 2n^2 - 6$

43) Find the sum of the following

102, 97, 92,...up to 27 terms.,

44) Find the sum of

2 + 4 + 6 +..+ 80

45) Solve $2x - 3y = 6$, $x + y = 1$

46) Find the LCM of the given expressions.

$4x^2y$, $8x^3y^2$

47) Multiply $\frac{x^3}{9y^2}$ by $\frac{27y}{x^5}$

48) Simplify $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{1}{x^2-8x+15}$

49) Write down the quadratic equation in general form for which sum and product of the roots are given below.

9, 14

50) Find the sum and product of the roots for each of the following quadratic equations:

$x^2 + 8x - 65 = 0$

51) Determine the quadratic equations, whose sum and product of roots are

-9, 20

52) Solve $2m^2 + 19m + 30 = 0$

53) Solve the following quadratic equations by factorization method

$4x^2 - 7x - 2 = 0$

54) Solve $x^2 + 2x - 2 = 0$ by formula method

55) Find the values of 'k', for which the quadratic equation $kx^2 - (8k + 4)x + 81 = 0$ has real and equal roots?

56) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of

$(\alpha - \beta)$

57) If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$, find the values of

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

58) Write each of the following expression in terms of $\alpha + \beta$ and $\alpha\beta$.

$\frac{\alpha}{3\beta} + \frac{\beta}{3\alpha}$

59) If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = \frac{-13}{7}$. Find the values of a.

60) If one root of the equation $2y^2 - ay + 64 = 0$ is twice the other then find the values of a.

61) If one root of the equation $3x^2 + kx + 81 = 0$ (having real roots) is the square of the other then find k.

62) Find the LCM of the given expressions.

$p^2 - 3p + 2$, $p^2 - 4$

63) Find the LCM and GCD for the following and verify that f(x) x g(x) = LCM x GCD

$(x^2y + xy^2)$, $(x^2 + xy)$

64) Reduce each of the following rational expressions to its lowest form.

$\frac{p^2-3p-40}{2p^3-24p^2+64p}$

65) Find the excluded values, if any of the following expressions.

$\frac{x^3-27}{x^3+x^2-6x}$

66) Simplify

$\frac{12t^2-22t+8}{3t} \div \frac{3t^2+2t-8}{2t^2+4t}$

67) Find the square root of the following

$(4x^2 - 9x + 2)(7x^2 - 13x - 2)(28x^2 - 3x - 1)$

68) Find the square root of the following polynomials by division method $16x^4 + 8x^2 + 1$

69) Determine the quadratic equations, whose sum and product of roots are

$\frac{-3}{2}$, -1

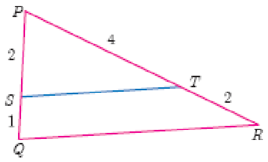
70) Determine the nature of roots for the following quadratic equations

$9x^2 - 24x + 16 = 0$

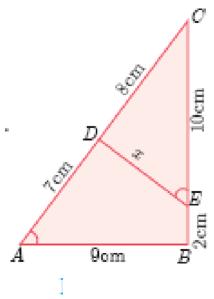
71) If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$, find the values of

$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

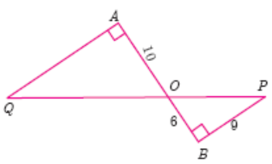
72) Show that △ PST~△ PQR



73) $\angle A = \angle CED$ prove that $\Delta\ CAB \sim \Delta CED$ Also find the value of x.

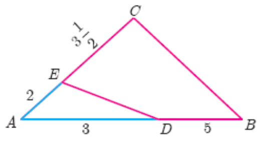


74) QA and PB are perpendiculars to AB. If AO = 10 cm, BO = 6 cm and PB = 9 cm. Find AQ.

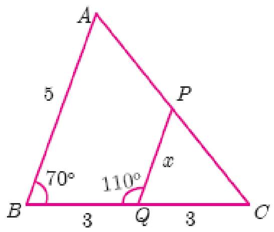


75) Check whether the which triangles are similar and find the value of x.

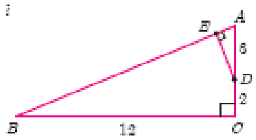
(i)



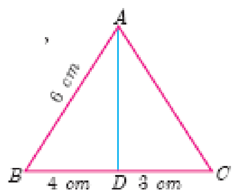
(ii)



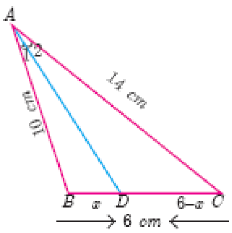
76) In the adjacent figure, △ABCis right angled at C and DE⊥ AB. Prove that △ABC~△ ADE and hence find the lengths of AE and DE.



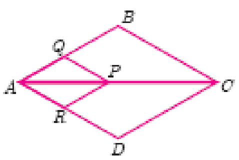
77) In the figure, AD is the bisector of ∠A. If BD = 4 cm, DC = 3 cm and AB = 6 cm, find AC.



78) In the Figure, AD is the bisector of ∠BAC, if A = 10 cm, AC = 14 cm and BC = 6 cm. Find BD and DC.



79) In fig. if PQ | | BC and PR | |CD prove that



$$\frac{AB}{AD} = \frac{AQ}{AB}$$

80) In △ABC, AD is the bisector of ∠A meeting side BC at D, if AB = 10 cm,AC = 14 cm and BC = 6 cm, find BD and DC

81) Find the area of the triangle formed by the points (1, –1), (–4, 6) and (–3, –5)

82) Vertices of given triangles are taken in order and their areas are provided aside. In each case, find the value of 'p'?

S.No	Vertices	Area (sq.units)
(i)	(0, 0), (p, 8), (6, 2)	20
(ii)	(p, p), (5, 6), (5, -2)	32

83) Find the slope of a line joining the given points (- 6, 1) and (-3, 2)

84) The line r passes through the points (–2, 2) and (5, 8) and the line s passes through the points (–8, 7) and (–2, 0). Is the line r perpendicular to s ?

85) The line p passes through the points (3, - 2), (12, 4) and the line q passes through the points (6, -2) and (12, 2). Is parallel to q ?

86) Show that the points (-2, 5), (6, -1) and (2, 2) are collinear

87) If the three points (3, - 1) , (a, 3) and (1, - 3) are collinear, find the value of a.

88) Calculate the slope and y intercept of the straight line 8x − 7y + 6 = 0

89) Find the equation of a line passing through the point (3, - 4) and having slope $\frac{-5}{7}$

90) Show that the straight lines 2x + 3y - 8 = 0 and 4x + 6y + 18 = 0 are parallel.

91) Show that the straight lines x - 2y + 3 = 0 and 6x + 3y + 8 = 0 are perpendicular.

92) Determine whether the sets of points are collinear ? (a, b + c), (b, c + a) and (c, a + b)

93) prove that $\frac{\sin A}{1+\cos A} = \frac{1-\cos A}{\sin A}$

94) prove that $1+\frac{\cot^2\theta}{1+\operatorname{cosec}\theta}$ = cosecθ

95) prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}}$ = cosec θ + cotθ

96) prove that $\frac{\sec\theta}{\sin\theta} - \frac{\sin\theta}{\cos\theta} = \cot\theta$

97) prove the following identities.

cot θ + tan θ = sec θ cosecθ

98) prove the following identities.

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$$

99) prove the following identities.

$\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$

100) prove the following identities

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = 2\sec\theta$$

100 x 5 = 500

101) Let A = {x ∈ N | 1 < x < 4}, B = {x ∈ W | 0 ≤ x < 2) and C = {x ∈ N | x < 3} Then verify that

(i) A x (B U C) = (A x B) U (A x C)

(ii) A x (B ∩ C) = (A x B) ∩ (A x C)

102) Given A = {1,2,3}, B = {2,3,5}, C = {3,4} and D = {1,3,5}, check if (A ∩ C) x (B ∩ D) = (A x B) ∩ (C x D) is true?

103) Let A = {x ∈ W| x < 2}, B = {x ∈ N| 1 < x ≤ 4} and C = (3,5). Verify that A x (B U C) = (A x B) U (A x C)

104) Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that (A ∩ B) x C = (A x C) ∩ (B x C)

105) If the function f: R⟶ R defined by

$$f(x) = \begin{cases} 2x + 7, x < -2 \\ x^2 - 2, -2 \leq x < 3 \\ 3x - 2, x \geq 3 \end{cases}$$

(i) f(4)

(ii) f(-2)

(iii) f(4) + 2f(1)

(iv) $\frac{f(1) - 3f(4)}{f(-3)}$

106) Let f: A ⟶ B be a function defined by f(x) = $\frac{x}{2}$-1, where A = {2, 4 , 6, 10, 12}, B = {0, 1, 2, 4, 5, 9}, Represent f by

(i) set of ordered pairs

(ii) a table

(iii) an arrow diagram

(iv) a graph

107) A function f: [-5,9] ⟶ R is defined as follows:

$$f(x) = \begin{cases} 6x + 1 & \text{if } -5 \leq x < 2 \\ 5x^2 - 1 & \text{if } 2 \leq x < 6 \\ 3x - 4 & \text{if } 6 \leq x \leq 9 \end{cases}$$

Find

i) f(-3) + f(2)

ii) f(7) - f(1)

iii) 2f(4) + f(8)

iv) $\frac{2f(-2) - f(6)}{f(4) + f(-2)}$

108) The function ‘t’ which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by t(C) = F where F = $\frac{9}{5}$C + 32. Find,

(i) t(0)

(ii) t(28)

(iii) t(-10)

(iv) the value of C whenn t(C) = 212

(v) the temperature when the Celsius value is equal to the Fahrenheit value.

109) Consider the functions f(x), g(x), h(x) as given below. Show that (f o g) o h = f o (g o h) in each case.

(i) f(x) = x - 1, g(x) = 3x + 1 and h(x) = x^2

(ii) f(x) = x^2, g(x) = 2x and h(x) = x + 4

(iii) f(x) = x - 4, g(x) = x^2 and h(x) = 3x - 5

110) If f(x) = x^2, g(x) = 3x and h(x) = x - 2, Prove that (f o g) o h = f o (g o h).

111) Let A ={x ∈ W | x < 2}, B={x ∈ N | 1 < x ≤ 4} and C = (3,5). Verify that A x (B ∩ C) = (A x B) ∩ (A x C)

112) Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that A x (B - C) = (A x B) - (A x C)

113) Find the HCF of 396, 504, 636.

114) If $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4}$ = 113400 where p_1, p_2, p_3, p_4 are primes in ascending order and x_1, x_2, x_3, x_4 are integers, find the value of p_1, p_2, p_3, p_4 and x_1, x_2, x_3, x_4

115) Determine the general term of an A.P. whose 7^{th} term is -1 and 16^{th} term is 17.

116) In an A.P., sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

117) The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.

118) The ratio of 6^{th} and 8^{th} term of an A.P is 7:9 Find the ratio of 9^{th} term to 13^{th} term

119) How many terms of the series 1 + 5 + 9 + ...must be taken so that their sum is 190?

120) The 13^{th} term of an A.P is 3 and the sum of the first 13 terms is 234.Find the common difference and the sum of first 21 terms.

121) Find the sum of all natural numbers between 300 and 600 which are divisible by 7.

122) The sum of first n, 2n and 3n terms of an A.P are S_1, S_2 and S_3 respectively prove that $S_3 = 3 (S_2 - S_1)$

123) The sum of first n terms of a certain series is given as $2n^2$ - 3n.Show that the series is an A.P

124) The 104^{th} term and 4^{th} term of an A.P. are 125 and 0. Find the sum of first 35 terms.

125) Find the sum of all odd positive integers less than 450.

126) Find the sum of all natural numbers between 602 and 902 which are not divisible by 4.

127) Find the sum $\left[\frac{a-b}{a+b}+\frac{3a-2b}{a+b}+\frac{5a-3b}{a+b}+\ldots \text{ to } 12 \text{ terms}\right]$

128) In a Geometric progression, the 4^{th} term is $\frac{8}{9}$ and the 7th term is $\frac{64}{243}$. Find the Geometric Progression.

129) The product of three consecutive terms of a Geometric Progression is 343 and their sum is $\frac{91}{3}$.Find the three terms.

130) In a G.P. the 9^{th} term is 32805 and 6^{th} term is 1215. Find the 12^{th} term

131) In a G.P. the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$.Find the three terms.

132) Find the sum to n terms of the series 5 + 55 + 555 +...

133) Find the least positive integer n such that $1 + 6 + 6^2 + \ldots + 6^n > 5000$

134) The sum of the cubes of the first n natural numbers is 2025. then Find the value of n.

135) Find the sum of
$5^2 + 10^2 + 15^2 + \ldots + 105^2$

136) Find the sum of
$9^3 + 10^3 + \ldots\ldots + 21^3$

137) Solve $\frac{1}{3}$ (x + y - 5) = y - z = 2x - 11 = 9 - (x + 2z).

138) One hundred and fifty students are admitted to a school. They are distrbuted over three sections A, B and C. If 6 students are shifted from section A to section C, the sections will have equal number of students. If 4 times of students of section C exceeds the number of students of section A by the number of students in section B, find the number of students in the three sections.

139) In a three-digit number, when the tens and the hundreds digit are interchanged the new number is 54 more than three times the original number. If 198 is added to the number, the digits are reversed. The tens digit exceeds the hundreds digit by twice as that of the tens digit exceeds the unit digit. Find the original number.

140) Find the GCD of the following by division algorithm $2x^4 + 13x^3 + 27x + 7$, $x^3 + 3x^2 + 3x + 1$, $x^2 + 2x + 1$

141) Find the square root of $289x^4 - 612x^3 + 970x^2 - 684x + 361$

142) A boat takes 1.6 hours longer to go 36 kms up a river than down the river. If the speed of the water current is 4 km per hr, what is the speed of the boat in still water?

143) Solve x + 2y - z = 5; x - y + z = -2; -5x - 4y + z = -11

144) Solve: $\frac{1}{2x}+\frac{1}{4y}-\frac{1}{3z}=\frac{1}{4};\ \frac{1}{x}=\frac{1}{3y};\ \frac{1}{x}-\frac{1}{5y}+\frac{4}{z}=2\frac{2}{15}$

145) The sum of the digits of a three-digit number is 11. If the digits are reversed, the new number is 46 more than five times the former number. If the hundreds digit plus twice

the tens digit is equal to the units digit, then find the original three digit number?

146) Given the LCM and GCD of the two polynomials p(x) and q(x) find the unknown polynomial in the following table

S.No	LCM	GCD	p(x)	q(x)
(i)	$a^3 - 10a^2 + 11a + 70$	$a - 7$	$a^2 - 12a + 35$	
(ii)	$(x^2 + y^2)(x^4 + x^2y^2 + y^4)$	$(x^2 - y^2)$		$(x^4 - y^4)(x^2 + y^2 - xy)$

147) If A = $\frac{2x+1}{2x-1}$, B = $\frac{2x-1}{2x+1}$ find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

148) If A = $\frac{x}{x+1}$, B = $\frac{1}{x+1}$, prove that $\frac{(A+B)^2+(A-B)^2}{A \div B} = \frac{2(x^2+1)}{x(x+1)^2}$

149) Find the square root of the expression $\frac{4x^2}{y^2} + \frac{20x}{y} + 13 - \frac{30y}{x} + \frac{9y^2}{x^2}$

150) If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b.

151) Find the values of m and n if the following expressions are perfect sqaures

$\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{m}{x} + n$

152) The product of Kumaran's age (in years) two years ago and his age four years from now is one more than twice his present age. What is his present age?

153) A girl is twice as old as her sister. Five years hence, the product of their ages (in years) will be 375. Find their present ages.

154) Prove that the equation $x^2(p^2 + q^2) + 2x(pr + qs) + r^2 + s^2 = 0$ has no real roots. If ps = qr, then show that the roots are real and equal.

155) If the roots of $(a - b)x^2 + (b - c)x + (c - a) = 0$ are real and equal, then prove that b, a, c are in arithmetic progression.

156) Find the square root of the following

$$\left(2x^2 + \frac{17}{6}x + 1\right)\left(\frac{3}{2}x^2 + 4x + 2\right)\left(\frac{4}{3}x^2 + \frac{11}{3}x + 2\right)$$

157) Find the values of a and b if the following polynomials are perfect squares

$ax^4 + bx^3 + 361x^2 + 220x + 100$

158) Find the values of m and n if the following expressions are perfect sqaures

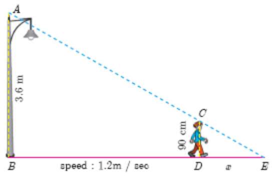
$x^4 - 8x^3 + mx^2 + nx + 16$

159) If α, β are the roots of the equation $2x^2 - x - 1 = 0$, then form the equation whose roots are

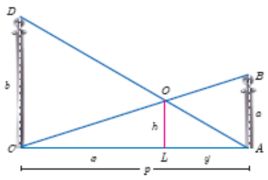
$2\alpha + \beta, 2\beta + \alpha$

160) A boy of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamppost is 3.6m above the ground, find the length of his shadow cast

after 4 seconds.

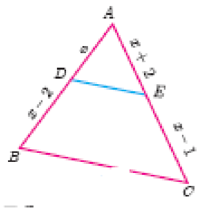


161) Two poles of height 'a' metres and 'b' metres are 'p' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\frac{ab}{a+b}$ meters

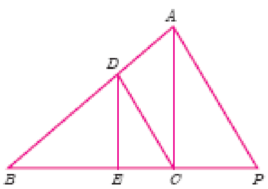


162) A girl looks the reflection of the top of the lamp post on the mirror which is 66 m away from the foot of the lamppost. The girl whose height is 12.5 m is standing 2.5 m away from the mirror. Assuming the mirror is placed on the ground facing the sky and the girl, mirror and the lamppost are in a same line, find the height of the lamp post.

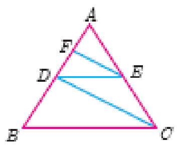
163) In △ ABC=, if DE||BC, AD = x, DB = x − 2, AE = x +2 and EC = x − 1 then find the lengths of the sides AB and AC.



164) In the figure DE||AC and DC||AP. Prove that $\frac{BE}{CE} = \frac{BC}{CP}$

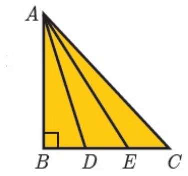


165) In figure DE || BC andCD. Prove that AD^2 = AB x AF



166) The perpendicular PS on the base QR of a △PQR intersects QR at S, such that QS = 3 SR. Prove that $2PQ^2 = 2PR^2 + QR^2$

167) In the adjacent figure, ABC is a right angled triangle with right angle at B and points D, E trisect BC. Prove that $8AE^2 = 3AC^2 + 5AD^2$



168) Basic Proportionality Theorem (BPT) or Thales theorem?

169) Converse of Angle Bisector Theorem

170) State the Pythagoras Theorem

171) State the Alternate Segment theorem

172) Angle Bisector Theorem

173) Converse of Basic Proportionality Theorem

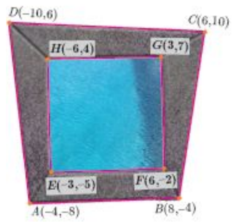
174) Find the area of the triangle whose vertices are (-3, 5) , (5, 6) and (5, - 2)

175) If the area of the triangle formed by the vertices A(-1, 2) , B(k, -2) and C(7, 4) (taken in order) is 22 sq. units, find the value of k.

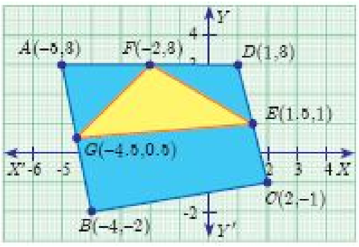
176) Find the value of k, if the area of a quadrilateral is 28 sq.units, whose vertices are (–4, –2), (–3, k), (3, –2) and (2, 3)

177) If the points A(- 3, 9) , B(a, b) and C(4, - 5) are collinear and if a + b = 1 , then find a and b.

178) In the figure, the quadrilateral swimming pool shown is surrounded by concrete patio. Find the area of the patio.



179) In the figure, find the area of triangle AGF



180) If the points A(2, 2), B(–2, –3), C(1, –3) and D(x, y) form a parallelogram then find the value of x and y.

181) Let A(3, - 4), B(9, - 4) , C(5, - 7) and D(7, - 7). Show that ABCD is a trapezium.

182) Find the equation of the median and altitude of Δ ABC through A where the vertices are A(6, 2), B(-5,-1) and C(1, 9)

183) Find the equation of a straight line Passing through (1, -4) and has intercepts which are in the ratio 2:5

184) Find the equation of a straight line which is parallel to the line 3x - 7y = 12 and passing through the point (6, 4).

185) Find the equation of the perpendicular bisector of the line joining the points A(-4, 2) and B(6, -4).

186) Find the equation of a straight line through the intersection of lines 7x + 3y = 10, 5x − 4y = 1 and parallel to the line 13x + 5y + 12 = 0

187) Find the equation of a straight line through the intersection of lines 5x − 6y = 2, 3x + 2y = 10 and perpendicular to the line 4x − 7y + 13 = 0

188) Find the equation of a straight line joining the point of intersection of 3x + y + 2 = 0 and x − 2y − 4 = 0 to the point of intersection of 7x − 3y = − 12 and 2y = x + 3

189) Find the equations of the lines, whose sum and product of intercepts are 1 and – 6 respectively.

190) if $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, then prove that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$

191) prove that $(\operatorname{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = 1$

192) prove that $\frac{sinA}{1+cosA} + \frac{sinA}{1-cosA} = 2cosecA.$

193) if $\operatorname{cosec}\theta + \cot\theta = p$, then prove that $\cos\theta = \frac{p^2-1}{p^2+1}$

194) prove that $\tan^2 A - \tan^2 B = \frac{sin^2A - sin^2B}{cos^2Acos^2B}$

195) prove that $\left(\frac{cos^3A - sin^3A}{cosA - sinA}\right) - \left(\frac{cos^3A + sin^3A}{cosA + sinA}\right) = 2sinAcosA$

196) prove that $\frac{sinA}{secA + tanA - 1} + \frac{cosA}{cosecA + cotA - 1} = 1$

197) If $\frac{cos^2\theta}{sin\theta} = p$ and $\frac{sin^2\theta}{cos\theta} = q$,then prove that $p^2q^2(p^2 + q^2 + 3) = 1$

198) prove the following identities.

$\sec^6\theta = \tan^6\theta + 3\tan^2\theta\sec^2\theta + 1$

199) If $\frac{cos\alpha}{cos\beta} = m$ and $\frac{cos\alpha}{sin\beta} = n$, then prove that $(m^2 + n^2)\cos^2\beta = n^2$

200) if $\cot\theta + \tan\theta = x$ and $\sec\theta - \cos\theta = y$, then prove that $\left(x^2y\right)^{\frac{2}{3}} - \left(xy^2\right)^{\frac{2}{3}} = 1$

 15 x 8 = 120

201) Discuss the nature of solutions of the following quadratic equations.

$x^2 + x - 12 = 0$

202) Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$

203) Graph the following quadratic equations and state their nature of solutions.

$x^2 - 9x + 20 = 0$

204) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$

205) Draw the graph of $y = x^2 + 3x + 2$ and use it to solve $x^2 + 2x + 1 = 0$

206) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$

207) Draw the graph of y = (x - 1) (x + 3) and hence solve $x^2 - x - 6 = 0$

208) Graph the following quadratic equations and state their nature of solutions.
(2x - 3)(x + 2) = 0

209) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5} < 1$)

210) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4} > 1$)

211) Draw a triangle ABC of base BC = 8 cm, ∠A = 60° and the bisector of ∠A meets BC at D such that BD = 6 cm.

212) Construct a △PQR which the base PQ = 4.5 cm,∠R = 35°and the median RG R to PG is 6 cm

213) Construct a △PQR in which QR = 5 cm, ∠P = 40° and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR.

214) Construct a △PQR such that QR = 6.5 cm,∠P = 60°and the altitude from P to QR is of length 4.5 cm.

215) Draw a triangle ABC of base BC = 5.6 cm, ∠A = 40° and the bisector of ∠A meets BC at D such that CD = 4 cm.

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