RAMA STUDY CENTRE WHATSAPP - 8754834604

MINIMUM STUDY MATERIAL FOR QUARTERLY EXAM

10th STANDARD

MATHS

ANSWERS FOR THIS MATERIALS COST Rs.75 ONLY,

WHASTAPP - 8754834604

2 marks:

1) Find $A \times B$, $A \times A$ and $B \times A$
$A = \{2, -2, 3\}$ and $B = \{1, -4\}$

2) 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, Range?

3) Find fog and gof when $f(x) = 2x+1$ and $g(x) = x^2 - 2$

4) If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \to B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B

5) If $f(x) = 2x+3$, $g(x) = 1-2x$ and $h(x) = 3x$. Prove that $fo(goh) = (fog)oh$

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

7) Solve $8x \equiv 1 \pmod{11}$

8) The general term of a sequence is defined as

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

Find the eleventh and eighteenth terms.

9) Find the first five terms of following sequences

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

10) Find the 19th term of an A.P $-11, -15, -19 \ldots$,

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

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

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

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

15) How many terms of the series $1+4+16+\ldots$ make the sum 1365 ?

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

17) Find the sum of $1+3+5+\ldots+$ to 40 terms

18) Find the sum of $1^3+2^3+3^3+\ldots+16^3$

19) If $1+2+3+\ldots+n = 666$ then find n

20) If $1^3+2^3+3^3+\ldots+k^3 = 44100$ find $1+2+3+\ldots+k$

21) Find the least positive value of x such that $98 \equiv (x+4) \pmod 5$

22) Find the least positive value of x such that $5x \equiv 4 \pmod 6$

23) Find the sum of the following
102, 97, 92 ... up to 27 terms

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

25) Find the LCM of the given expressions
$4x^2y$, $8x^3y^2$

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

27) Determine the quadratic equation, whose sum and product of roots are $-9, 20$

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

29) If α, β are the roots of the equation $3x^2+7x-2=0$ find the value of $\alpha/\beta + \beta/\alpha$

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

31) Find the LCM of the given expression
p^2-3p+2, p^2-4

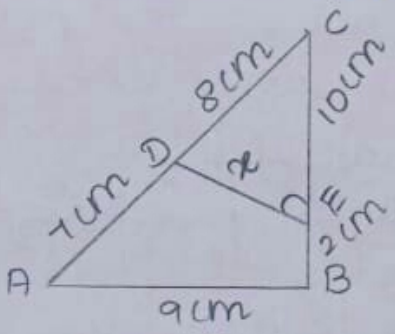
32) Simplify $\frac{12t^2-22t+8}{3t} \div \frac{8t^2+2t-8}{2t^2+4t}$

33) Find the LCM and GCD for the following and verify that $f(x) \times g(x) = LCM \times GCD$ $(x^2y + xy^2), (x^2 + xy)$

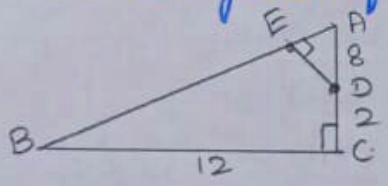
34) Find the square root of the following
$(4x^2 - 9x + 2)$ $(7x^2 - 13x - 2)$ $(28x^2 - 3x - 1)$

35) Determine the quadratic equation, whose sum and products of the roots are $-3/2, -1$

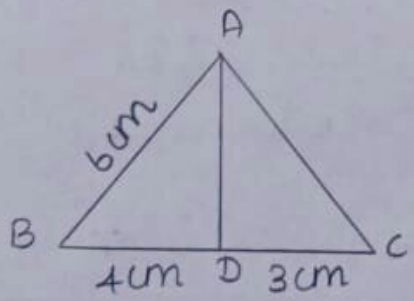
36) $\angle A = \angle CED$ prove that $\triangle CAB \sim \triangle CED$. Also find the value of x.



37) In the adjacent figure, $\triangle ABC$ is right angled at C and $DE \perp AB$. Prove that $\triangle ABC \sim \triangle ADE$ and hence find the lengths of AE and DE

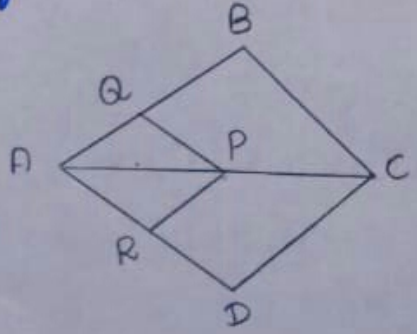


38) In the figure the AD is the bisector of $\angle A$. If BD = 4cm, DC = 3cm and AB = 6cm find AC



39) In fig, if PQ || BC and PR || CD prove that

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



40) Find the area of the triangle formed by points $(1,-1), (-4,6)$ and $(-3,-5)$

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

42) The line r passes through the points $(-2,2)$ and $(5,8)$ and the line s passes through the points $(-8,7)$ and $(-2,10)$. Is the line r perpendicular to s?

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

44) Calculate the slope and y-intercept of the straight line $8x-7y+6=0$

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

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

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

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

49) prove the following identities

$\cot\theta + \tan\theta = \sec\theta \operatorname{cosec}\theta$

50) prove the following identities

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

5 marks:

51) Let $A = \{x \in W / x < 2\}$, $B = \{x \in N / 1 < x \leq 4\}$ and $C = \{3,5\}$ verify that $A \times (B \cup C) = (A \times B) \cap (B \times C)$

52) Given $A = \{1,2,3\}$, $B = \{2,3,5\}$, $C = \{3,4\}$ and $D = \{1,3,5\}$ check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?

53) Let $f: A \to B$ be a function defined by $f(x) = \frac{x}{2} - 1$ where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$
Represented f by
i) set of ordered pairs
ii) a table
iii) an arrow diagram
iv) a graph

54) A function $f: [-5, 9] \to R$ is defined as following

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

find, i) $f(-3) + f(2)$ ii) $f(7) - f(1)$
iii) $2f(4) + f(8)$ iv) $\frac{2f(-2) - f(6)}{f(4) + f(-2)}$

55) The function 't' which maps temperature in Celcius (C) into temperature in Fahrenhiet (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 when $t(C) = 212$
v) the temperature when the celsius value is equal to the fahrenhiet value.

56) If $f(x) = x^2$, $g(x) = 3x$ and $h(x) = x - 2$, prove that $(fog)oh = fo(goh)$

57) Find the HCF of 396, 504, 636

58) 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

59) If an A.P sum of four consecutive terms is 28 and their sum of their square is 276. Find the four numbers

60) The sum of three consecutive terms that are in AP is 27 and their product is 288. Find three terms

61) How many terms of the series $1+5+9+\ldots\ldots$ must be taken so that their sum is 190?

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

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

64) The product of three consecutive terms of a Geometric progression is 343 and their sum is $9\frac{1}{3}$. Find the three terms

65) Find the sum to n terms of series $5+55+555+\ldots$

66) Find the sum of $9^3 + 10^3 + 2^3 \ldots + 21^3$

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

68) 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 terms. If 198 is added to the number. the digits are reversed. The ten digit exceeds the hundreds digit by twice as that of ten digit exceeds the unit digit. Find the original number

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

70) Solve $x+2y-z=5$, $x-y+z=-2$, $-5x-4y+z=-11$

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

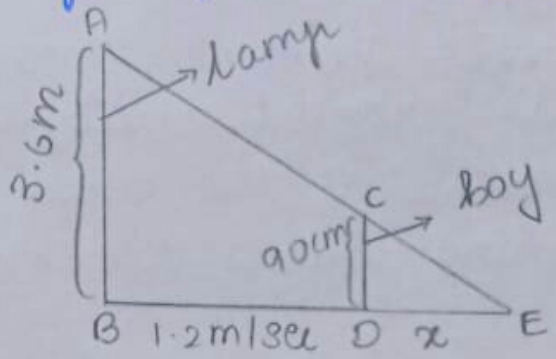
72) Find the values of m and n if the following expressions are perfect squares $\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{m}{x} + n$

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

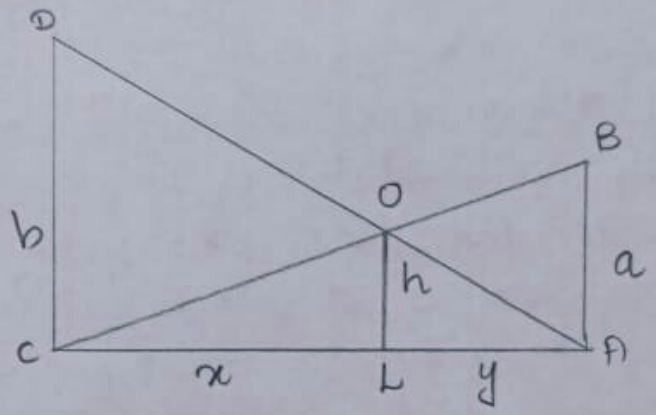
74) Prove that the equation $x^2(p^2+q^2) + 2x(pr+qs) + r^2+s^2 = 0$ has no real roots. If $ps = qr$. then show that the roots are real and equal.

75) Find the values of m and n if the following expressions are perfect square $x^4 - 8x^3 + mx^2 + nx + 16$

16) A boy of height 90 cm 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 sec

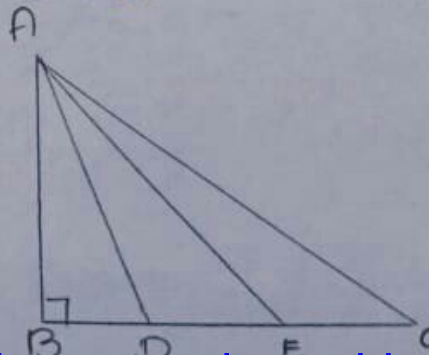


17) Two poles of height 'a' metre and 'b' metre are 'p' metres apart. Prove that the height of the point of intersection of the line joining the top of each pole to the foot of the opposite pole is given by $\frac{ab}{a+b}$ metres.



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

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



80) Basic Proportionality Theorem (BPT) or Thales theorem

81) Converse of Angle Bisector Theorem

82) State the Pythagoras theorem

83) State the Alternate Segment theorem

84) Converse of Basic proportionality theorem

85) 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 $(2,3)$

86) 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

87) 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

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

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

90) 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 $2y=x+3$

91) Find the equation of lines, whose sum and product of intercepts are 1 and -6 respectively

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

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

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

95) prove that $\frac{\sin A}{1+\cos A}+\frac{\sin A}{1-\cos A}=2\operatorname{cosec}A$

96) prove that $\frac{\sin A}{\sec A + \tan A - 1} + \frac{\cos A}{\operatorname{cosec} A + \cot A - 1} = 1$

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

98) prove the following identities
$\sec^6\theta = \tan^6\theta + 3\tan^2\theta\sec^2\theta + 1$

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

100) If $\cot\theta + \tan\theta = x$ and $\sec\theta - \cos\theta = y$, then prove that $(x^2y)^{2/3} - (xy^2)^{2/3} = 1$

101) Discuss the nature of solutions of the following quadratic equation $x^2 + x - 12 = 0$

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

103) Graph the following quadratic equation and state their nature of solutions $x^2 - 9x + 20 = 0$

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

105) Draw the graph of $y = x^2 + 3x + 2$ and hence solve $x^2 + 2x + 1 = 0$

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

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

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

109) Construct a triangle similar to a given $\triangle PQR$ with its sides equal to $3/5$ of corresponding sides of $\triangle PQR$ (scale factor $3/5 < 1$)

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

111) Draw a ΔABC of base $BC = 8cm$. $\angle B = 60°$ and the bisector of $\angle A$ meets BC at D such that $BD = 6cm$

112) Construct a ΔPQR which the base $PQ = 4.5cm$, $\angle R = 35°$ and the median RG R to PG is 6cm

113) Construct a ΔPQR in which $QR = 6.5cm$, $\angle P = 60°$ and the altitudes from P to QR is of length 4.5cm

114) Construct a triangle PQR in which $QR = 5cm$. $\angle P = 40°$ and the median PG from P to QR is 4.4cm. Find the length of altitude from P to QR

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

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