RAMA STUDY CENTRE WHATSAPP - 8754834604.

10th STANDARD [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER-1

1) If $A \times B = \{(3,2), (3,4), (5,2), (5,4)\}$, then find A and B

2) 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?

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

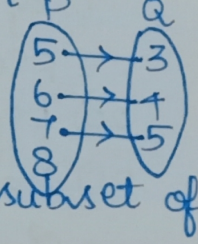
4) Let A = The set of all natural numbers less than 8. B = The set of all prime numbers less than 8, C = The set of even prime number. Verify $A \times (B - C) = (A \times B) - (A \times C)$

5) Let $A = \{3,4,7,8\}$ and $B = \{1,7,10\}$. Which of following sets are relations from A to B?

i) $R_1 = \{(3,7)(4,7)(7,10)(8,1)\}$ ii) $R_2 = \{(3,1),(4,12)\}$

iii) $R_3 = \{(3,7)(4,10)(7,7)(7,8)(8,11)(8,7)(8,10)\}$

6) The arrow diagram shows a relationship between sets P and Q. Write the relation in i) set builder form ii) Roaster form iii) What is domain range of R



7) Let $A = \{1,2,3,4 \ldots 45\}$ and R be the relation defined as 'is square of' on A. Write R as a subset of A x A. Also, find the domain and range of R

8) 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

9) A company has four categories of employees given by Assistants (A), clerks (C), Manager (M) and an Executive Officer (E). The company provide ₹10,000, ₹25,000, ₹50,000 and ₹1,00,000 as salaries to the people who work in the categories A, C, M, E respectively. If A_1, A_2, A_3, A_4 and A_5 were assistants; C_1, C_2, C_3, C_4 were clerks; M_1, M_2, M_3 were managers and E_1, E_2 were Exe. officers and if the relation R is defined by xRy, where x is salary given to person y, express R in ordered pair, arrow diagr

10) A relation f is defined by $f(x) = x^2 - 2$ where $x \in \{-2, -1, 0, 3\}$ i) List the elements of f ii) Is f a function

11) Given $f(x) = 2x - x^2$, i) $f(1)$ ii) $f(x+1)$ iii) $f(x) + f(1)$

12) Let $X = \{3, 4, 6, 8\}$. Determine whether the relation $R = \{(x, f(x)) \mid x \in X, f(x) = x^2 + 1\}$

13) A function f is defined by $f(x) = 3 - 2x$. Find x such that $f(x^2) = (f(x))^2$

14) A plane is flying at a speed of 500km per hour. Express the distance d travelled by plane as function of t in hours

15) Let f be a functions from R to R defined by $f(x) = 3x - 5$ Find the values of a and b given that $(a, 4)$ and $(1, b) \in f$

16) The distance S (in kms) travelled by particle in time t hrs is given by $S(t) = t^2 + t/2$. Find the distance travelled by particle after i) three and half hrs ii) 8hr and 15 min

17) Let $f: A \to B$ be a function defined by $f(x) = \frac{x}{2} - 1$, where $A = \{2, 4, 6, 10, 22\}$, $B = \{0, 1, 2, 4, 5, 9\}$. Represented f by i) set of ordered pairs ii) a table iii) an arrow diagram iv) graph

18) Let $A = \{-1, 1\}$ and $B = \{0, 2\}$. If the function $f: A \to B$ defined by $f(x) = ax + b$ is an onto function ? Find a and b.

19) If the function f is defined by $f(x) = \begin{cases} x+2 & \text{if } x > 1 \\ 2 & \text{if } -1 \le x \le 1 \\ x-1 & \text{if } -3 < x < -1 \end{cases}$

Find i) $f(3)$ ii) $f(0)$ iii) $f(-1.5)$ iv) $f(2) + f(-2)$

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

21) Represent the function $f(x) = \sqrt{2x^2 - 5x + 3}$ as a composition of two functions

22) Find the value of k, such that $fog = gof$

i) $f(x) = 3x + 2$, $g(x) = 6x - k$ ii) $2x - k = f(x)$, $g(x) = 4x + 5$

23) Let $f(x) = x^2 - 1$. Find i) fog ii) fofof.

24) Consider the functions $f(x)$, $g(x)$, $h(x)$ is given below, show that $(fog)oh = fo(goh)$ in each case i) $f(x) = x - 1$, $g(x) = 3x + 1$, $h(x) = x^2$

25) Let $f = \{(-1, 3)(0, -1)(2, -9)\}$ be a linear function from Z into Z. find $f(x)$

26) In electrical circuit theory, a circuit $c(t)$ is called a linear circuit if it satisfies the superposition principle is given by $c(at_1 + bt_2) = ac(t_1) + bc(t_2)$ where a, b are constants show that the circuit $c(t) = 3t$ is linear.

G. Rajesh MSc, B.Ed., MBA.., MSc(psh) MA(Eco), MA(Yoga), MA(TAM) Dep of math

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10th STANDARD [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER - 2

1) Show that the square of an odd integer is of the form $4q+1$, for some integer q
2) If the highest common Factor of 210 and 55 is expressible in the form $55x - 325$, find x
3) Find the HCF of 396, 504 and 636
4) Prove that the product of two consecutive positive integers is divided by 2.
5) Prove that square of any integer leaves the remainder either 0 or 1 when divided by 4.
6) If d is the highest common factor of 32 and 60, find x and y satisfying $d = 32x + 60y$.
7) Prove that two consecutive positve integers are always coprime.
8) a and b are two positive integers such that $a^b \times b^a = 800$ Find a and b
9) Find the HCF of 252525 and 363636
10) If $13824 = 2^a \times 3^b$ then find a and b
11) 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 primers 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.
12) Find the least number that is divisible by the first ten natural numbers.
13) Find the remainders when 70004 and 778 is divided by 7.
14) Find the least positive value of x such that
    i) $67 + x \equiv 1 \pmod 4$ ii) $98 \equiv (x+4) \pmod 5$
15) Solve $8x \equiv 1 \pmod{11}$
16) A man starts his journey from chennai to delhi by train He starts at 22.30 hours on wednesday. If it takes 32hrs of travelling time and assuming that the train is not late when will he reach delhi?
17) If x is congruent to 13 modulo 17 then $7x - 3$ is congruent to which number modulo 17?
18) Solve $3x - 2 \equiv 0 \pmod{11}$
19) Today is Tuesday. My uncle will come after 45 days. In

which day my uncle will be coming?

20) Prove that $2^n x + 6 x 9^n$ is always divisible by 7 for any positive integer n

21) Find the remainder when 2^{81} is divided by 17

22) Find a_8 and a_{15} whose n^{th} terms is $a_n = \begin{cases} \frac{n^2-1}{n+3}, & n \text{ is even} \\ \frac{n^2}{2n+1} & n \text{ is odd} \end{cases}$

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

24) Write an A.P whose first term is 20 and common difference is 8

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

26) If l^{th}, m^{th} and n^{th} terms of an A.P are x, y, z respectively i) $x(m-n)+y(n-l)+z(l-m)=0$ ii) $(x-y)n+(y-z)l+(z-x)m=0$.

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

28) Find the middle terms of an A.P 9, 15, 21, 27.., 183.

29) If nine times ninth term is equal to 15 times 15 term show that six times twenty fourth term is zero.

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

31) Find x, y and z, given that the numbers x, 10, y, 24, z are in AP

32) In a theatre, there are 20 seats in the front row and 30 rows were alotted. Each sucessive row contains two additional seats than its front row. How many seats are there in the last row?

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

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

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

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

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

38) How many consecutive odd integers beginning with 5 will sum to 480?

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

40) If $S_1, S_2, S_3 \ldots, S_m$ are the sums of n terms of m A.P's whose first terms are 1, 2, 3 ... m and whose common differences are 1, 3, 5 .., (2m-1) respectively, then show that $S_1 + S_2 + S_3 + \ldots + S_m = \frac{1}{2} mn(mn+1)$

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

42) The product of three consecutive terms of a G.P is 343 and their sum is 91/3. Find the three terms

43) In a G.P 729, 243, 81 .., find t_7.

44) Find x so that x+6, x+12 and x+15 are consecutive terms of a Geometric progression

45) In a G.P the 9th term is 32805 and 6th term is 1215. Find the 12th term

46) In a G.P the product of three consecutive terms is 27 and the sum of product of two terms taken at a term taken at a time is 57/2. Find the three terms

47) If a, b, c are three consecutive terms of an A.P and x, y, z are three consecutive terms of a G.P then prove that $x^{b-c} \times y^{c-a} \times z^{a-b} = 1$

48) Find the sum of $3 + 1 + \frac{1}{3} + \frac{1}{9} + \ldots \infty$

49) Find the sum to n terms of the series 3 + 33 + ... to n terms

50) If $S_n = (x+y) + (x^2+xy+y^2) + (x^3+x^2y+xy^2+y^3) + \ldots$ n terms then prove that $(x-y)S_n = \left[\frac{x^2(x^n-1)}{x-1} - \frac{y^2(y^n-1)}{y-1}\right]$

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

52) Find the sum of following series $1+3+5+\ldots+71$

53) If $1+2+3+\ldots+k = 325$ then find $1^3+2^3+\ldots+k^3$

54) Rekha has 15 square colour papers of sizes 10cm, 11cm 12cm, 24 cm. How much arear can be decorted with these colour papers.

G. Rajesh M.Sc., B.Ed., MBA., M.Sc(psh), MA(Eco), MA(Yoga), MA(Tam)., Dept of mathematics.

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10th STANDARD [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER-3

1) Solve the following system of linear equation in three variables $3x-2y+z=2$, $2x+3y-z=5$, $x+y+z=6$.

2) Vani, her father and her grand father have an average age of 53. One half of her grand father's age plus one third of her father's age plus one fourth of Vani's age is 65. Four years ago if vani's grandfather was four times as old as Vani then how old are they all now?

3) Find the GCD of $6x^3-30x^2+60x-48$ and $3x^3-12x^2+21x-18$

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

ii) p^2-3p+2, p^2-4

5) Find the excluded values of the following expressions $\frac{x}{x^2+1}$

6) If $x=\frac{a^2+3a-4}{3a^2-3}$ and $y=\frac{a^2+2a-8}{2a^2-2a-4}$ find the value of x^2y^{-2}

7) If a polynomial $p(x)=x^2-5x-14$ is divided by another polynomial $q(x)$ we get $\frac{x-7}{x+2}$ find $q(x)$

8) Find $\frac{x^2+20x+36}{x^2-3x-28}-\frac{x^2+12x+4}{x^2-3x-28}$

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

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

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

12) Pari needs 4 hours to complete a work. His friend Yuan needs 6 hrs to complete the same work. How long will it take to completye if they work together?

13) Find the square root of the following expressions

i) $\frac{144\,a^8b^{12}c^{16}}{81\,f^{12}g^4h^{14}}$ ii) $\frac{400\,x^4y^{12}z^{16}}{100\,x^8y^4z^4}$

14) FInd the square root of $64x^4-16x^3+17x^2-2x+1$

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

16) Find the zeroes of the quadratic expression $x^2+8x+12$

17) Determine the quadratic equation whose sum and product of the roots are $-(2-a)^2$, $(a+5)^2$

18) solve $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$

19) solve the following quadratic equation by factorisation method $\sqrt{a(a-7)} = 3\sqrt{2}$

20) solve $pqx^2 - (p+q)^2 x + (p+q)^2 = 0$

21) A ladder 17 feet long is leaning against a wall. If the ladder, vertical wall and the floor from the bottom of the wall do the ladder form a right triangle, Find the height of the wall where the top of the ladder meets If the distance between bottom of the wall to bottom of ladder is 7 feet less than the height of the wall?

22) If the difference between a number and its reciprocal is $\frac{24}{5}$, find the number

23) The hypotenuse of a right angled triangle is 25cm and its perimeter 56 cm. Find the length of smallest side

24) 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

25) 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

26) If the roots of the equation $(c^2-ab)x^2 - 2(a^2-bc)x + b^2 - ac = 0$ are real and equal prove that either $a=0$ or $a^3+b^3+c^3 = 3abc$

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

28) If a matrix has 18 elements, what are the possible orders it can have? What if it has 6 elements.

29) constuct a 3x3 matrix whose elements are given by
i) $a_{ij} = |i-2j|$ ii) $a_{ij} = \frac{(i+j)^3}{3}$.

30) Find x and y if $x+y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $x-y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

31) solve for x, y: $\begin{pmatrix} x^2 \\ y^2 \end{pmatrix} + 2\begin{pmatrix} -2x \\ -y \end{pmatrix} = \begin{pmatrix} -5 \\ 8 \end{pmatrix}$

32) Let $A = \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 4 & 0 \\ 1 & -5 \end{pmatrix}$, $C = \begin{pmatrix} 2 & 0 \\ 1 & 2 \end{pmatrix}$ show that $(A-B)C = AC - BC$

33) If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ show that $A^2 - (a+d)A = (bc-ad)I_2$

34) If $A = \begin{pmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 7 \\ 1 & 2 \\ 5 & 1 \end{pmatrix}$ verify that $(AB)^T = B^T A^T$

35) If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 5A + 7I_2 = 0$.

G. Rajesh MSc, B.Ed., MBA.., MSc (psh), MA (Eco), MA (Yoga), MA (Tam).
Dept of mathematics

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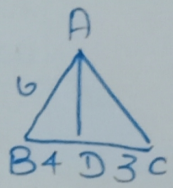
10th STANDARD [IMPORTANT QUESTIONS]

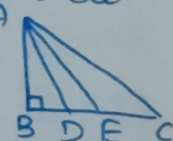
MATHEMATICS

CHAPTER - 4.

1) If $\triangle ABC$ is similar to $\triangle DEF$ such that $BC = 3cm$, $EF = 4cm$ and area of $\triangle ABC = 54\ cm^2$. find the area of $\triangle DEF$
2) A girl looks the reflection of the top of the lamp post on the mirror which is 66 m away from the foot of lamppost The girl whose height is 12.5m is standing 2.5 away from the mirror. Assuming the mirror is placed on ground facing the sky and the girl, mirror and the lamppost are in a same line, find the height of the lamp post.
3) A vertical stick of length 6m casts a shadow 400cm long on the ground and at the same time a tower casts a shadow 28m long. Using similarity, find the height of tower.
4) Basic proportionality theorem (BPT) or Thales theorem
5) Angle Biseiter theorem
6) AD is a bisector of $\angle A$. If $BD = 4cm$, $DC = 3cm$ and $AB = 6cm$ find AC



7) Pythagoras theorem
8) P and Q are the mid points of the sides CA and CB respectively of $\triangle ABC$, right angled at C. Prove $4(AQ^2 + BP^2) = 5AB^2$
9) what length of ladder is needed to reach a height of 4ft along the wall when the base of the ladder is 4ft from the wall: Round of your answer to next tenth place
10) An aeroplane leaves an airport and flies due north at a speed of 1000 km/hr. How far apart will be the two planes after 1½ hrs? At the same time, another plane leaves an airport and flies due west at a speed of 1200km/hr
11) A man goes 18m due east and then 24m due north. Find the distance of his current position from starting point?
12) In the adjacent figure, ABC is a right angled triangle with right angle at B and points D, E trisect BC. Prove that $8AE^2 = 3AC^2 + 5AD^2$



13) Alternate segment theorem
14) PQ is a chord of length 8cm to a circle of radius 5cm. The tangents at P and Q intersect at a point T. Find the length of the tangent TP

15) If two concentric circle of radii 4cm and 5cm then find the length of the chord of one circle which is a tangent to another circle

16) Ceva's theorem

17) Show that in a triangle, the medians are concurrent

18) Show that the angle bisectors of a triangle are concurrent

G. Rajesh MSc., B.Ed., MBA.., MSc(psh), MA(Eco), MA(Yoga), MA(Tam)
Dept of mathematics.

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10th STANDARD [IMPORTANT QESTIONS]

MATHEMATICS

CHAPTER-5

1) Find the area of the triangle whose vertices are (-3,5), (5,6) and (5,-2)
2) If the points P(-1,-4), Q(b,c) and R(5,-1) are collinear and if 2b+c=4 then find the values of b and c
3) Find the value of K, if the area of quadrilateral is 28 sq.units, whose vertices are (-4,-2),(-3,k)(3,-2), and (2,3)
4) If the points A(-3,9), B(a,b) and C(4,-5) are collinear and if a+b=1, the find a and b
5) The liner 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 perperdicular to s?
6) The line p passes through the points (3,-2),(12,4) and the line q passes thraugh the points (6,-2) and (12,2). Is p parallel to q?
7) Without using Pythagoras theorem, shaw that the points (1,-4),(2,-3) and (4,-7) form a right angled triangle
8) Prove analitically that the line segment joining the mid points of two sides of a triangle is parallel to 3rd side and is equal to half of its length.
9) Let A(3,-4), B(9,-4), C(5,-7) and D(7,-7). shaw that ABCD is a traperium
10) A quadrilateral has vertices at A(-4,-2), B(5,-1) C(6,5) and D(-7,6). shaw that the mid points of its sides form a parallelogram
11) Calculate the slope and y intercept of straight line $8x-7y+6=0$
12) Find the equation of a line passing through the point (3,-4) and having slope $-5/7$
13) Find the equation of a straight line passing through (5,-3) and (7,-4)
14) Find the intercepts made by the line $4x-9y+36=0$ on the coordinate axes
15) A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3,8). Find its equation

16) Find the slope and y intercept of $\sqrt{3}x + (1-\sqrt{3})y = 3$.

17) A cat is located at a point $(-6,-4)$ in xy plane. A bottle of milk is kept at $(5, 11)$. The cat wish to consume the milk travelling through shortest possible distance. Find the equation of the path it needs to take its milk.

18) Find the equation of median and altitude of ΔABC through A where the vertices are $A(6,2)$, $B(-5,-1)$ and $C(1,9)$

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

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

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

22) Find the slope of line which is i) parallel to $y = 0.7x - 11$ ii) perpendicular to the line $x = -11$

23) If the straight lines $12y = -(p+3)x + 12$, $12x - 7y = 16$ are perpendicular then find 'p'.

24) 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 $2y = x+3$

25) Find the equation of a straight line through the point of intersection of lines $8x+3y=18$, $4x+5y=9$ and bisecting the line segment joining the points $(5,-4)$ and $(-7,6)$

G. Rajesh M.Sc., B.Ed., MBA., MSc (psh), MA (Eco), MA (Yoga), MA (Tam) Dept of Mathematics

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10th STANDARD - [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER - 6.

1) Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$

2) Prove that $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$

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

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

5) Prove the following identities $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$

6) i) If $\sin\theta + \cos\theta = \sqrt{3}$, then prove that $\tan\theta + \cot\theta = 1$
ii) If $\sqrt{3}\sin\theta - \cos\theta = 0$, then show that $\tan 3\theta = \frac{3\tan\theta - \tan^3\theta}{1-3\tan^2\theta}$

7) If $\sin\theta + \cos\theta = p$ and $\sec\theta + \operatorname{cosec}\theta = q$. prove $q(p^2-1) = 2p$

8) If $\frac{\cos\theta}{1+\sin\theta} = \frac{1}{a}$, then prove that $\frac{a^2-1}{a^2+1} = \sin\theta$

9) A kite is flying at a height of 75m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string, assuming that there is no slack in the string.

10) From a point on a ground, the angles of elevation of bottom and top of a tower fixed at a top of 30m high building are 45° and 60° respectively. Find the height of the tower

11) Two trees are standing on flat ground. The angle of elevation of the top of both the trees from a point x on the ground is 40°. If horizontal distance between x and the smaller tree is 8m and the distance of the top of two trees is 20m, calculate the distance between the point x and the top of the smaller tree and the horizontal distance between the two trees ($\cos 40° = 0.7660$)

12) Find the angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of a tower of height $10\sqrt{3}$ m.

13) A player sitting on the top of a tower of height 20m observes the angle of depression of a ball lying on the ground is 60°. Find the distance between the foot of the tower and the ball ($\sqrt{3} = 1.732$)

14) From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.

15) From the top of a lighthouse, the angle of depression of two ships on the opposite sides of it are observed to be 30° and 60°. If the height of the lighthouse is h meters and the line joining the ships passes through the foot of the lighthouse, show that the distance between the ship is $\frac{4h}{\sqrt{3}}$ m.

16) A pole 5m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point A on the ground is 60° and the angle of depression to the point A from the top of tower is 45°. Find the height of the tower ($\sqrt{3} = 1.732$)

17) If the angle of elevation of a cloud from a point 'h' m above the lake θ_1 and the angle of depression of its reflection in the lake is θ_2. Prove that the height that the cloud is located from the ground is $\frac{h(\tan\theta_1 + \tan\theta_2)}{\tan\theta_2 - \tan\theta_1}$

G1. Rajesh M.Sc, B.Ed., MBA., MSc(psh), MA(Eco), MA (Yoga), MA (Tam)
Dept of mathematics.

RAMA STUDY CENTRE WHATSAPP- 8754834604

10th STANDARD [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER -7

1) The curved surface area of a right circular cylinder of height 14 cm is $88 cm^2$. Find the diameter of the cylinder
2) If one litre of paint covers $10 m^2$, how many litres of paint is required to paint the internal and external surface area of a cylindrical tunnel whose thickness is 2m, internal radius is 6m and height is 25m
3) The radius of a conical tent is 7m and height is 24m. Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4m?
4) If the total surface area of a cone of radius 7cm is $704 cm^2$ then find its slant height.
5) If the base area of a hemispherical solid is 1386 sq. metres find its total surface area
6) A girl wishes to prepare birthday caps in the form of right circular cones for her birthday party, using a sheet of papers whose area is $5720 cm^2$, how many caps can be made with radius 5cm and height 12cm
7) The frustum shaped outer portion of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if the cost of painting 1 sq.cm is ₹2
8) The volumes of two cones of same base radius are $3600 cm^3$ and $5040 cm^3$. Find the ratio of heights
9) A toy is in the shape of a cylinder surmounted by a hemisphere. The height of toy is 25cm. Find the total surface area of the toy if its common diameter is 12cm
10) A capsule is in the shape of a cylinder with two hemisphere stuck to each of its ends. If the length of the entire capsule is 12mm and the diameter of the capsule is 3mm. how much medicine it can hold.
11) An aluminium sphere of radius 12cm is melted to make a cylinder of radius 8cm. Find the height of the cylinder.
12) A solid sphere of radius 6cm is melted into a hollow cylinder of uniform thickness. If the external radius of base of cylinder is 5cm and its height is 32cm, then find the thickness of the cylinder.

G. Rajesh M.Sc, B.Ed., MBA., MSc(psh), MA(Eco), MA(Yoga), MA(Tam) Dept of maths

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10th STANDARD [IMPORTANT QUESTIONS]

MATHEMATICS

CHAPTER - 8

1) Find the range and coefficient of range of the following data : 25, 67, 48, 53, 18, 39, 44.
2) Find the mean and variance of the first n natural numbers
3) A teacher asked the students to complete 60 pages of a record note book. Eight students have completed only 32, 35, 31, 30, 33, 36, 35 and 31 pages. Find the standard deviation of pages yet to be completed by them.
4) Find the standard deviation of first 21 natural numbers
5) The mean of a data is 25.6 and its coefficient of variation is 18.75. Find the standard deviation
6) If $n = 5$, $\bar{x} = 6$, $\Sigma x^2 = 765$, then calculate the coefficient of variation.
7) The time taken to complete a homework by 8 students in a day are given by 38, 40, 41, 44, 46, 43, 49, 53. Find the coefficient of variation.
8) A die is rolled and a coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows a head.
9) If A is an event of a random experiment such that $P(A) : P(\bar{A}) = 17 : 15$ and $n(S) = 640$ then find i) $P(\bar{A})$ ii) $n(A)$
10) What is the probability of drawing either a king or a queen in a single draw from a well shuffled pack of 52 cards.
11) If A and B are two events such that $P(A) = 1/4$, $P(B) = 1/2$ and $P(A \text{ and } B) = 1/8$ find i) $P(A \text{ or } B)$ ii) $P(\text{not } A \text{ and not } B)$
12) A card is drawn from a pack of 52 cards. Find the propability of getting a king or a heart or a red card.
13) In a town of 8000 people, 1300 are over 50 years and 3000 are females. It is known that 30% of the females are over 50 years. What is the probability that a chosen individual from the town is either a female or over 50 years?
14) The probability that atleast one of A and B occur is 0.6. If A and B occur simultaneously with probability 0.2. then find $P(\bar{A}) + P(\bar{B})$.

G. Rajesh M.Sc, B.Ed., MBA.,
MSc (Psh), MA (Eco), MA (Yoga),
MA (Tam) Dept of mathematics.