



ASHWANI GUPTA

Class IX-X: Math & Science
Class XI-XII: Accts., Eco. & B. Stds.
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}

CLASS X.

MATHEMATICS. (SA-1)

M.M.90

SECTION A (Carry one mark each)

- Q1. Write a quadratic polynomial whose parabola is intersecting 'x' axis at 5 & -8.
- Q2. Write the pair of linear equations, If five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. Taking 'x' years for Nuri's age & 'y' for Sonu's age.
- Q3. If $\tan A = \sqrt{3}$ & $\tan B = 1$, then find the value of A : B.
- Q4. Find the median, if $N = 80$; $cf. = 28$; $class\ size = 10$; $l = 30$; $f = 15$.

SECTION-B (carry two mark each)

- Q5. Show that any straight line parallel to the parallel sides of a trapezium cuts the other two sides proportionally.
- Q6. In a triangle OPQ, right-angled at P, $OP = 7\text{ cm}$ and $OQ - PQ = 1\text{ cm}$. Determine the values of $\sin Q$ and $\cos Q$.
- Q7. Using Euclid's division algorithms find the H C F of 84, 90 and 120.
- Q8. If $\sin \theta = 1/2$, show that $3\cos \theta - 4\cos^3 \theta = 0$.
- Q9. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of ΔPQR . Show that $\Delta ABC \sim \Delta PQR$.
- Q10. if α and β are the zeros of the polynomial $f(x) = 3x^2 - 6x + 4$, find a quadratic polynomial whose zeros are $(\alpha + \beta)$ and $(\alpha - \beta)$.

SECTION-C (carry three marks each)

- Q11. Show that one and only one out of $n, n + 2$ or $n + 4$ is divisible by 3, where n is any positive integer.
- Q12. Find the values of a and b for which the following system of linear equations has infinite solutions:
$$2x - (a - 4)y = 2b + 1$$
$$4x - (a - 1)y = 5b - 1$$
- Q13. In an equilateral Δ , prove that three times the square on one side is equal to four times the square of its altitudes.



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Q14. Draw more than ogive for the given data:

C.I.	0-10.	10-20.	20-30.	30-40.	40-50	50-60.	60-70
Freq	11.	5.	8.	12.	15	4	5

Q15. If $\sin \theta + \cos \theta = 3$, then prove that $\tan \theta + \cot \theta = 1$.

Q16. Draw the graphs of the pair of linear equations $x - y + 2 = 0$ and $4x - y - 4 = 0$. Calculate the area of the triangle formed by the lines so drawn.

Q17. If $\operatorname{cosec} \theta + \cot \theta = p$, then prove that $\cos \theta = p^2 - 1/p^2 + 1$.

Q18. Two pipes running together can fill the cistern in 11 minutes. If one pipe takes 5 minutes more than the other to fill the cistern. Find the pipe in which each pipe would fill the cistern.

Q19. Prove that: *In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.*

Q20. If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes
SECTION-D (carry four marks each)

Q21. Show that $\sqrt{2} + \sqrt{5}$ is irrational number.

Q22. ABC is a right Δ , right angled at B and AD and CE are two medians drawn from A and C respectively. If $AC = 5\text{cm}$ and $AD = 12\text{cm}$. Find CE.

Q23. The sum of the numerator and denominator of a fraction is 7. Four times the numerator is 8 less than 5 times the denominator. Find the fraction.

Q24. ABC is a triangle in which $\angle ABC > 90^\circ$ and $AD \perp CB$ produced. Prove that $AC^2 = AB^2 + BC^2 + 2BC \cdot BD$.

Q25. Prove that :

$$\frac{\tan A - \cot A}{\sin A \cos A} = \sec^2 A - \operatorname{cosec}^2 A$$

Q26. Find the value of x & y : if the median of 82 observations is 41, for the given data.

C.I.	10-20	20-30	30-40	40-50	50-60	60-70
f.	10.	x.	15.	20.	y.	11

Q27. Triangle ABC is a right angled triangle at A and AD is perpendicular to BC. If $BC = 13\text{cm}$ & $AC = 5\text{cm}$, find the ratio of the areas of *triangles ABC & ADC*.

Q28. Father's age is three times the sum of ages of his two sons. After 5 years his age will be twice the sum of ages of the two sons. Find the age of father.

Q29. Find the mean for the given data.

C.I.	≥ 500	≥ 600	≥ 700	≥ 800	≥ 900	≥ 1000	≥ 1100	≥ 1200
f.	127	120.	112.	105.	101.	95.	70	57

Q30. If p & q are the zeroes of the polynomial $f(x) = x^2 - 8x + a$ and the sum of the squares of the zeroes is equal to 40. Find the value of 'a'.

Q31. If ABC & DBC are two triangles on the same base BC and AD intersects BC at O, prove that the ratio of areas of both triangles is equal to the ratio of AO & DO.