

IX
DAY CENTENARY PUBLIC SCHOOL
UMA (MP)

- Q1 Factorise: $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$.
- Q2. If $4x^3 + 7x^2 - 3x - 6$ is divided by $x+1$, then find the quotient.
- Q3. If $a-b=7$ and $a^2+b^2=85$, find a^3-b^3 .
- Q4 Factorise: $(p+q)^2 - 20(p+q) - 125$.
- Q5. The volume of a cuboid is polynomial $p(x) = 8x^3 + 12x^2 - 2x - 3$.
 Find the possible expression for the dimension of the cuboid. Verify the result by taking $x=5$ units.
- Q6. If p and q be the remainders, when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x+1)$ and $(x-2)$ respectively. If $2p+q=6$, find the value of a .
- Q7. If a, b and c are all non-zero but their sum is zero, then show that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$.
- Q8. Using Heron's formula, find the area of an equilateral Δ with side 16 cm.
- Q9. Find area of triangle whose sides are 13 cm, 14 cm, 15 cm.
- Q10. Three vertices of a rectangle are $(3, 2)$, $(-4, 2)$ and $(-4, 5)$. Plot these points and find the w -ordinates of fourth vertex.
- Q11. The sides of a triangular plate are 8 cm, 15 cm and 17 cm. If its weight is 96 gm. Find the weight of plate per sq. cm.
- Q12. If the polynomial $f(x) = px^3 + 4x^2 + 3x - 4$ and $g(x) = x^3 - 4x + p$ are divided by $(x-3)$, then remainder in each case is same. Find the value of p .
- Q13. Let R_1 and R_2 are remainders when polynomial $f(x) = 4x^3 + 3x^2 - 12x - 5$ and $g(x) = 2x^3 + ax^2 - 6x + 2$ are divided by $(x-1)$ and $(x+2)$ respectively. If $3R_1 + R_2 + 28 = 0$, find the value of 'a'.
- Q14. Find the value of k , if $(x-3)$ is a factor of $k^2x^2 - kx - 2$.
- Q15. Factorise: i) $y^3 - 7y + 6$. ii) $x^3 + 13x^2 + 32x + 20$
- Q16. If $(x-2)$ and $(x-\frac{1}{2})$ are factors of $px^2 + 5x + 2$, show that $p=2$.
- Q17. Expand: $(-2x + 3y + 2z)^2$
- Q18. Verify that: $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$
- Q19. Resolve into factors: $1+a+b+c+ab+bc+ca+abc$.

Q20 Factorise: $x^6 - y^6$.

Q21 Three vertices of square are $P(-1, -9)$, $Q(3, -1)$, $R(-5, 3)$
Plot the points. Also find the co-ordinate of missing vertex D.

Q22 Name the quadrant/Axis in which the points lie:

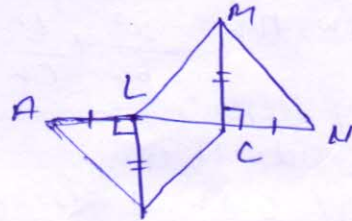
$(1, 1)$; $(0, 5)$; $(-2, -4)$; $(1, -2)$; $(-2, 0)$.

Q23. Write the x-co-ordinate of a point lie on y-axis.

Q24. Plot the points $A(2, 0)$, $B(2, 2)$, $C(0, 2)$ and draw the line segments OA , AB , BC and CO . What do you obtain? Find its Area.

Q25. Find the co-ordinates of vertices of ~~square~~ rectangle placed in III quadrant in cartesian plane with length 'p' unit of x-axis and breadth 'q' unit on y-axis.

Q26. In the figure $BL \perp AC$, $MC \perp LN$, $AL = CN$ and $BL = CM$. Prove that $\triangle ABE \cong \triangle NML$



Q27. Prove that angles opposite to equal sides of an isosceles triangle are equal.

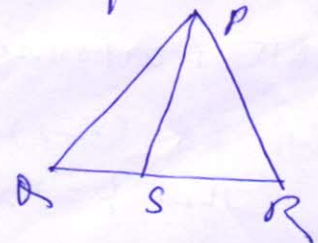
Q28. In $\triangle ABC$ is an isosceles \triangle with $AB = AC$, side BA is produced to D such that $AB = AD$. Prove that $\angle BCD$ is a right-angle.

Q29. Prove that two triangles are congruent if any two angles and included side of one triangle is equal to any two angles and included side of the other triangle.

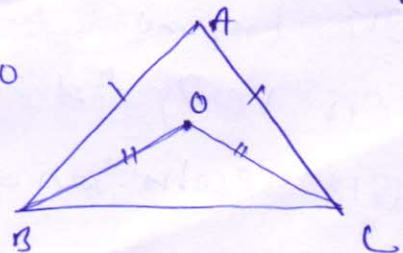
Q30. AB and CD are respectively the smallest and longest sides of quadrilateral ABCD (see fig).
Show that $\angle A > \angle C$ and $\angle B > \angle D$.

Q31. Show that in a right-angled \triangle hypotenuse is the longest side.

Q32. In the figure 'S' is any point on the side QR of $\triangle PQR$.
Prove that $PQ + QR + RP > 2PS$



Q33. In $\triangle ABC$, O is mid point of side AC such that $BO = \frac{1}{2}AC$.
Show that $\angle ABC$ is right angle.



Q34. In the given figure, find ratio $\angle ABO : \angle ACO$

VNA (H.P)

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Q1. Simplify: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left(\frac{25}{9}\right)^{-\frac{3}{2}}$

Q2. Find the square root of 4.7 geometrically

Q3. If $\sqrt{5} = 2.235$ and $\sqrt{10} = 3.162$, find the value of $\left(\frac{\sqrt{10} - \sqrt{5}}{\sqrt{2}}\right)$

Q4. Find a rational number between $-\frac{3}{7}$ and $\frac{1}{3}$.

Q5. Simplify: $\left[\{(625)^{-\frac{1}{2}}\}^{-\frac{1}{4}}\right]^2$

Q6. Simplify: $\{(-2)^0 + (5)^0 + (-13)^0 \}^{-2}$

Q7. If $x^{\frac{1}{2}} = 49^{\frac{1}{24}}$, find the value of x .

Q8. Represent $1 + \sqrt{3}$ on the number line

Q9. Simplify: $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt{32} + \sqrt{225}$

Q10. Locate $\sqrt{17}$ on the number line.

Q11. Express 15.725 in the form $\frac{p}{q}$ where p and q are integers.

Q12. Express $1.3\bar{2} + 0.\bar{35}$ as a fraction in simplest form.

Q13. Find 'n', if $2^{n-7} \times 5^{n-4} = 1250$.

Q14. Simplify: $\frac{1}{\sqrt{5} + \sqrt{6} - \sqrt{11}} \left[\frac{\text{Ans } 5\sqrt{6} + 6\sqrt{5} + \sqrt{330}}{60} \right]$

Q15. Simplify: $\frac{1}{2 + \sqrt{5}} + \frac{1}{\sqrt{5} + \sqrt{6}} + \frac{1}{\sqrt{6} + \sqrt{7}} + \frac{1}{\sqrt{7} + \sqrt{8}}$ [Ans $(-2 + \sqrt{8})$]

Q16. Find the value of a and b, if $\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} + \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}} = a + \sqrt{5}b$.

Q17. If $x = \frac{\sqrt{p+q} + \sqrt{p-q}}{\sqrt{p+q} - \sqrt{p-q}}$, then prove that [Ans. $a=3$, $b=0$]

$qx^2 - 2px + q = 0$

Q18. If $a = 7 - 4\sqrt{3}$, find the value of $\sqrt{a} + \frac{1}{\sqrt{a}}$.

