IX

DAV CENTENARY PUBLIC SCHOOL
UNA (HP)

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 dimensions 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 $\triangle$ 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 co-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 $(x-3)$, their remainder in each case is same. Find the value of p.

Q13. Let R_1 and R_2 are remainders when polynomial $f(x) = 4x^3 + 3x^2 - 12ax - 5$ 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 $px^2 + 5x + r$, show that $p = r$.

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 lies :

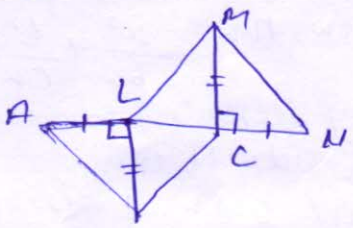
(1, 1) ; (0, 5) ; (−2, −4) ; (1, −2) ; (−2, 0) .

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 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 ⊥ AC, MC ⊥ LN, AL = CN and BL = CM. Prove that $\triangle ABL \cong \triangle NML$



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

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

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

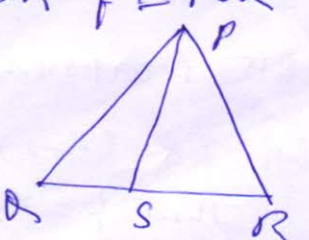
Q30 AB and CD are respectively the smallest and longest sides of quadrilateral ABCD (see fig)

Show that ∠A > ∠C and ∠B > ∠D.

Q31 Show that in a right Led $\triangle$ hypotenuse is the longest side.

Q32. In the figure 'S' is any point on the side QR of $\triangle PQR$

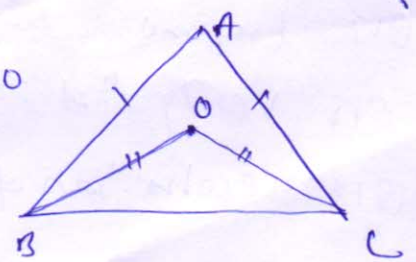
Prove that PQ + QR + RP > 2PS



Q33 In $\triangle ABC$, D is mid point of side AC such that $BD = \frac{1}{2}AC$

Show that ∠ABC is right angle.

Q34 In the given figure, find ratio ∠ABO : ∠ACO



D.A.V. CENTENARY PUBLIC SCHOOL IX (HAREHOPER)

VNA (CH. 8)

24

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

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

Q7 If $x^{\frac{1}{12}} = 49^{\frac{1}{24}}$, find the value of x.

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

Q9 Simplify: $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt[5]{32} + \sqrt{225}$

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

Q11 Express $15.7\overline{25}$ in the form $\frac{p}{q}$ where p and q are integers.

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

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

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

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 $\frac{7+3\sqrt{5}}{3+\sqrt{5}} + \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a+\sqrt{5}b$. [Ans. $a=3$, $b=0$]

Q17. If $x = \frac{\sqrt{p+q}+\sqrt{p-q}}{\sqrt{p+q}-\sqrt{p-q}}$, then prove that $qx^2 - 2px + q = 0$

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

Q19. Simplify : $\frac{2^{x+1}+2^x}{2^{x+1}-2^x}$.

Q20 Prove that $\frac{1}{1+x^{c-a}+x^{b-a}} + \frac{1}{1+x^{a-b}+x^{c-b}} + \frac{1}{1+x^{a-c}+x^{b-c}} = 1$

Q21. Show that $(x^{p+q})^{p-r} \times (x^{q+r})^{q-r} \times (x^{r+p})^{r-p} = 1$

Q22 Define the following terms : (i) Parallel lines (ii) intersecting lines. (iii) line segment (iv) square. (v) radius.

Q23 Prove that two distinct lines cannot have more than one point in common.

Q24 Write all the five postulate of Euclid.

Q25 Does Euclid's fifth postulate imply the existance of parallel lines. Explain.

Q26. Show that every line segment has one and only one mid point.

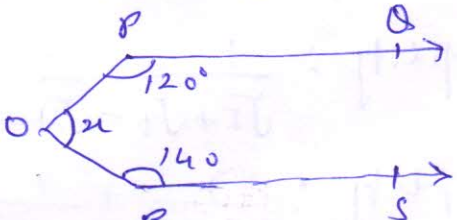
Q27 Prove that vertically opposite angles are equal.

Q28. Prove that sum of 3 angles of a Δ is 180°.

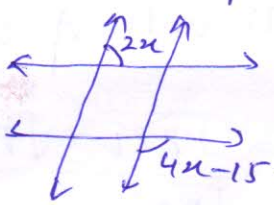
Q29. Prove that sum of three exterior angle of a Δ is 360°.

Q30. Two parallel lines are intersected by a transversal. Prove that the bisectors of two pairs of interior angles enclose a rectangle.

Q31 In the figure PQ || RS, find x



Q32. In the fig. $l_1 \| l_2$ and $a_1 \| a_2$. Find the value of x



Q33. In the given figure, AB || CD and CD || EF. Also EA ⊥ AB. If ∠BEF = 55° find the value of x, y and z