DAV CENTENARY PUBLIC SCHOOL UNA (HP) CH-2 VII-II **X**

Q1 Show that one and only one out of $n, n+2, n+4$ is divisible by 3, where n is an positive integer.

Q2 The decimal expansion $\frac{23457}{2^3 \times 5^4}$ will terminate after how many places of decimal.

Q3 Find the zeros of the following quadratic polynomial and verify the relationship between the zeros and co-efficients
(i) $6x^2-3-7x$ (ii) $4x^2+8x$ (iii) $4\sqrt{3}x^2+5x-2\sqrt{3}$.

Q4. Obtain all the zeros of the polynomial $x^4-3x^3-x^2+9x-6$, if two of its zeros are $\sqrt{3}$ and $-\sqrt{3}$.

Q5 Obtain all zeros of $2x^4-6x^3+3x^2+3x-2$, if two of its zeros are $\frac{1}{\sqrt{2}}$ and $-\frac{1}{\sqrt{2}}$.

Q6. If α and β are the zeros of the polynomial $x^2-(k+6)x+2(2k-$ find the value of k, if $\alpha+\beta=\frac{1}{2}\alpha\beta$.

Q7. If α and β are zeros of the polynomial x^2-6x+a, find 'a' if $\beta=-2$.

Q8. If one zero of quadratic polynomial $f(x)=4x^2-8kx-9$ is negative the other, find the value of k.

Q9. What must be added to x^3-4x^2+x-6 so that x^2+2x-3 becomes its factors.

Q10 Find whether $2x^2-1$ is a factor of $2x^5+10x^4+2x^2+5x+1$ or not.

Q11 Find zeros of (i) x^2-3 (ii) $6x^2-7$

Q12 If α and β are the zeros of the polynomial $f(x)=3x^2-7x-6$ find a polynomial whose zeros are
(i) α^2 and β^2 (ii) $2\alpha+3\beta$ and $3\alpha+2\beta$ (iii) 2α and 2β

Q13 Find the quadratic polynomial whose zeros are.
(i) $-\frac{4}{5}$ and $\frac{1}{3}$ (ii) $2+\sqrt{3}$ and $2-\sqrt{3}$ (iii) $\frac{2}{3}$ and $-\frac{1}{3}$.

Q14 If α and β are zeros of the polynomial $6x^2+x-1$ then find the value of (i) $\alpha^3\beta+\alpha\beta^3$ (ii) $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}+2\left(\frac{1}{\alpha}+\frac{1}{\beta}\right)+3\alpha\beta$

Q15. Given that $\sqrt{3}$ is a zero of polynomial x^3+x^2-3x-3, find its other two zeros.

Q16 If two zeros of the polynomial $x^4-6x^3-26x^2+138x-35$ are $2\pm\sqrt{3}$, find other zeros.

Q17 What must be added to $f(x)=4x^4+2x^3-2x^2+x-1$ so that resulting polynomial is divisible by $g(x)=x^2+2x-3$.

Q18 If the polynomial $f(x)=x^4-6x^3+16x^2-25x+10$ is divided by another polynomial x^2-2x+k, the remainder comes out to be $x+a$. Find k and a.

Q19 State Fundamental Theorem of Arithmetic.

Q20 Find HCF of 65 and 117 and express it in the form $65x+117y$.

Q21 If d is the HCF of 45 and 27 find x, y satisfying $d=27x+45y$.

Q22 Show that n^2-1 is divisible by 8, if n is an odd +ve integer

Q23. Using Euclid's division lemma, prove that for any +ve integer n, n^3-n is divisible by 6.

UT-6, UT-1 DAV CENT. PUBLIC SCHOOL

CLASS - X

UNA (HP)

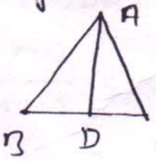
Q1 The perpendicular AD on the base BC of $\triangle ABC$ intersects BC in D such that $BD = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$.

Q2 In an equilateral $\triangle ABC$, D is the point on side BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$.

Q3. In an equilateral $\triangle ABC$, prove that three times the square of one side is equal to four times the square of one of its altitude

Q4 In a rhombus ABCD, prove that $AB^2 + BC^2 + CD^2 + DA^2 = AC^2 + BD^2$.

Q5. In the given figure, $\angle B$ of $\triangle ABC$ is an acute angle and $AD \perp BC$, prove that $AC^2 = AB^2 + BC^2 - 2BC \cdot BD$.



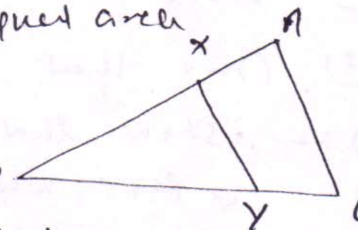
Q6 In a right $\angle$ed $\triangle$, the square of the hypotenuse is equal to the sum of the square of other two sides. Prove it.

Q7. BL and CM are medians of a $\triangle ABC$ right $\angle$ed at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.

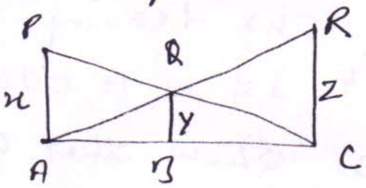
Q8 State and prove Thale's Theorem.

Q9. Prove that ratio of area of two similar triangles is equal to the ratio of the squares of their corresponding sides.

Q10 In the given figure, the line segments $XY \parallel AC$ and XY divides the triangular region ABC into two parts of equal area. Determine $\frac{AX}{AB}$.



Q11 In the given figure PA, QB and RC are each perpendicular to AC. Prove that $\frac{1}{x} + \frac{1}{z} = \frac{1}{y}$.



Q12 Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at O. Using similarity criterion for two $\triangle$s show that $\frac{OA}{OC} = \frac{OB}{OD}$.

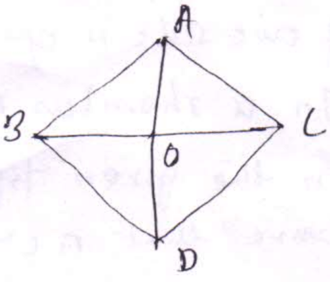
Q13. D is a point of the side BC of a $\triangle ABC$ such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$.

Q14 The area of two similar triangles are in the ratio of the squares of the corresponding median

Q15 Prove that area of the equilateral $\triangle$ described on the side of the square is half the area of the equilateral $\triangle$ described on its diagonal.

Q16 In the given figure, ABC and DBC are two $\triangle$s on the same base BC. If AD intersects BC at O, prove that

$$\frac{\text{area}(\triangle ABC)}{\text{area}(\triangle DBC)} = \frac{AO}{DO}.$$



Q17 If the area of two similar $\triangle$s are equal, then $\triangle$s are congruent.

Q18 ABC is a right triangle right ∠ed at C. Let $BC = a$, $CA = b$, $AB = c$ and let p be the length of perpendicular from C on AB. Prove that (i) $cp = ab$ (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

Q19. ABCD is a trapezium in which $AB \parallel DC$ and its diagonals intersect each other at O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

Q20 Prove that $\sqrt{7}$ is irrational no.

Q21 Prove that $\sqrt{5} - 2\sqrt{3}$ is irrational.

Q22. Show that any +ve odd integer is of the form $6q+1$ or $6q+3$ or $6q+5$, where q is some integer.

Q23. Find the largest positive integer that will divide 398, 436 and 542 leaving remainder 7, 11 and 15 respectively.

Q24 If n is odd integer, then show that $n^2 - 1$ is divisible by 8.

Q25 Show that 9^n cannot end with digit 2 for any $n \in N$.

Q26 Using Euclid's division algorithm to find HCF of 4052 and 12576.

Q27 Explain why $3 \times 5 \times 7 + 7$ is a composite number.

Q28. Show that the square of an odd positive integer can be of the form $6q+1$ or $6q+3$ for some integer q.