

CLASS: X

TOPIC: REAL NUMBERS

SUBJECT: MATHEMATICS

1. If $7 \times 5 \times 3 \times 2 + 3$ is composite number? Justify your answer
2. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$ where q is a positive integer
3. Prove that $\sqrt{2} + \sqrt{5}$ is irrational
4. Use Euclid's Division Algorithms to find the H.C.F of

a) 135 and 225	(45)
b) 4052 and 12576	(4)
c) 270, 405 and 315	
5. Prove that $5 - 2\sqrt{3}$ is an irrational number
6. Find the HCF and LCM of 26 and 91 and verify that $\text{LCM} \times \text{HCF} = \text{Product of two numbers}$ (13,182)
7. Explain why $\frac{29}{2^3 \times 5^3}$ is a terminating decimal expansion
8. given that $\text{LCM}(77, 99) = 693$, find the HCF (77, 99) (11)
9. Find the greatest number which exactly divides 280 and 1245 leaving remainder 4 and 3 (138)
10. Prove that $\sqrt{2}$ is irrational
11. The LCM of two numbers is 64699, their HCF is 97 and one of the numbers is 2231. Find the other (2813)
12. If $\text{HCF}(6, a) = 2$ and $\text{LCM}(6, a) = 60$ then find a (20)
13. Two numbers are in the ratio 15: 11. If their HCF is 13 and LCM is 2145 then find the numbers (195,143)
14. Express 0.363636..... in the form a/b (4/11)
15. Find the HCF 52 and 117 and express it in form $52x + 117y$
16. Write the HCF of smallest composite number and smallest prime number
17. Write whether $\frac{2\sqrt{45} + 3\sqrt{20}}{2\sqrt{5}}$ on simplification give a rational or an irrational number

PREPARED BY: MAHABOOB PASHA IX – X BOYS

CLASS: X
SUBJECT: MATHEMATICS

TOPIC: POLYNOMIALS

1. Show that $x^2 - 3$ is a factor of $2x^4 + 3x^3 - 2x^2 - 9x - 12$
2. Divide: $4x^3 + 2x^2 + 5x - 6$ by $2x^2 + 3x + 1$ (2x-2, 9x-4)
3. Find other zeroes of the polynomial $p(x) = 2x^4 + 7x^3 - 19x^2 - 14x + 30$ if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$ (3/2, -5)
4. Find all the zeroes of the polynomial $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{5}/3$ and $-\sqrt{5}/3$ (-1, -1)
5. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if it is known that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$ (1, $\frac{1}{2}$)
6. 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 (k = 5, a = -5)
7. Find the polynomial, whose zeroes are $2 + \sqrt{3}$ and $2 - \sqrt{3}$ ($x^2 - 4x + 1$)
8. Form a quadratic polynomial, one of whose zero is $2 + \sqrt{5}$ and the sum of zeroes is 4
9. If α and β are zeroes of the polynomial $x^2 - 2x - 15$, then form a quadratic polynomial whose zeroes are 2α and 2β
10. Write a quadratic polynomial, the sum and product of whose zeroes are 3 and -2 ($x^2 - 3x - 2$)
11. Find the zeroes of the polynomial and verify the relationship between the zeroes and the coefficient
 a) $4x^2 - 4x + 1$ b) $x^2 - 3$ c) $\sqrt{3}x^2 - 8x + 4\sqrt{3}$
12. If α and β are the zeroes of the polynomial $2y^2 + 7y + 5$, write the value of $\alpha + \beta + \alpha\beta$ (-1)
13. If one root of the polynomial $5x^3 + 13x + k$ is reciprocal of the other, then find the value of k ?
14. What must be subtracted from $2x^4 - 11x^3 + 29x^2 - 40x + 29$, so that the resulting polynomial is exactly divisible By $x^2 - 3x + 4$ (-2x + 5)
15. If the polynomial $6x^4 + 8x^3 - 5x^2 + ax + b$ is exactly divisible by the polynomial $2x^2 - 5$, then find the values of a and b (-20, -25)
16. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are $a - b$, a , $a + b$, find a and b (1, $\pm\sqrt{2}$)
17. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial $g(x)$, the quotient and remainder were $x - 2$ and $-2x + 4$, respectively Find $g(x)$ ($x^2 - x + 1$)
18. If α and β are the zeroes of the polynomial $f(x) = 6x^2 + x - 2$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$ (5/6)
19. If α and β are the zeroes of the quadratic polynomial $2x^2 + 3x - 5$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ (8/15)
20. If α and β are the zeroes of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find k (-3/5)
21. If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value of a (6)
22. If α, β are the zeroes of quadratic polynomial $2x^2 + 5x + k$, find the value of k such that $(\alpha + \beta)^2 - \alpha\beta = 24$ (3/2)

PREPARED BY: MAHABOOB PASHA IX - X BOYS

INTERNATIONAL INDIAN SCHOOL, RIYADH

CLASS: X

TOPIC: TRIGONOMETRY

1. If $\cot\theta = 15/8$, evaluate $\frac{(2 + 2\sin\theta)(1 - \sin\theta)}{(1 + \cos\theta)(2 - 2\cos\theta)}$ (225/64)
2. If $7\sin^2\theta + 3\cos^2\theta = 4$, show that $\tan\theta = 1/\sqrt{3}$
3. Evaluate: $\tan^2 60^\circ - 2\cos^2 60^\circ - \frac{3}{4}\sin^2 45^\circ - 4\sin^2 30^\circ$ (9/8)
4. Evaluate: $\frac{\sec^2 54^\circ - \cot^2 36^\circ}{\operatorname{Cosec}^2 57^\circ - \tan^2 33^\circ} + 2\sin^2 38^\circ \sec^2 52^\circ - \sin^2 45^\circ$ (5/2)
5. Evaluate: $\sqrt{2}\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ ($\sqrt{2}$)
6. If $\sec^2\theta (1+\sin\theta)(1-\sin\theta) = k$, find the value of k ($k = 1$)
7. Evaluate: $(\sin 90^\circ + \cos 45^\circ + \cos 60^\circ)(\cos 0^\circ - \sin 45^\circ + \sin 30^\circ)$ (7/4)
8. Find the value of:

$$\frac{2\sin 68^\circ}{\cos 22^\circ} - \frac{2\cot 15^\circ}{5\tan 75^\circ} - \frac{3\tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$$
 (1)
9. If $\sin(A+B) = 1$, $\cos(A-B) = 1$, find A and B ($45^\circ, 45^\circ$)
10. If $\cos(40^\circ + x) = \sin 30^\circ$, find the value of x (20°)
11. $\sin 4A = \cos(A - 20^\circ)$, where $4A$ is an acute angle, find the value of A (22°)
12. Find the acute angles A and B , $A > B$, if $\sin(A+2B) = \sqrt{3}/2$ and $\cos(A+4B) = 0$ ($30^\circ, 15^\circ$)
13. Evaluate: $\sec(90^\circ - \theta)\operatorname{cosec}\theta - \tan(90^\circ - \theta)\cot\theta + \frac{\cos^2 35^\circ + \cos^2 55^\circ}{\tan 5^\circ \tan 15^\circ \tan 45^\circ \tan 75^\circ \tan 85^\circ}$ (2)
14. If $\sin A - \cos B = 0$, prove that $A + B = 90^\circ$
15. If $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{5}{3}$, evaluate $\frac{7\tan\theta + 2}{2\tan\theta + 7}$ (2)
16. What is the maximum value of $1/\sec\theta$
17. If A, B and C are interior angles of triangle ABC , show that $\cos\left\{\frac{B+C}{2}\right\} = \sin\frac{A}{2}$
18. If $x = a\sin\theta$, $y = b\tan\theta$. Prove that $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$
19. Prove that: $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = 2\sec^2\theta$
20. Prove that: $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = 2\operatorname{cosec}\theta$

PREPARED BY: MAHABOOB PASHA IX – X BOYS

