



Grade X
Mathematics

Section A

- Q.1 The HCF and LCM of two numbers are 9 and 360 respectively. If one number is 45, find the other number. (1)
- Q.2 Has the rational number $\frac{441}{2^3 \cdot 7^2 \cdot 5^7}$ a terminating or a nonterminating decimal representation? Explain. (1)
- Q.3 Write the polynomial, the product and sum of whose zeroes are $\frac{-9}{2}$ and $\frac{-3}{2}$ respectively. (1)
- Q.4 Find the value of k so that the following system of equations has no solution? (1)
- $$3x - y - 5 = 0$$
- $$6x - 2y + k = 0$$

Section B

- Q.5 Prove that $15 + 7\sqrt{3}$ is an irrational number. (2)
- Q.6 Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients of the polynomial. (2)
- Q.7 Show that only one of the numbers n, n+2 and n+4 is divisible by 3. (2)

Section C

- Q.8 Prove that
 $(\sec A - \tan A)^2 \cdot (1 + \sin A) = 1 - \sin A$ (3)
- Q.9 Solve for x and y
 $(a - b)x + (a + b)y = a^2 - 2ab - b^2$
 $(a + b)(x + y) = a^2 + b^2$ (3)
- Q.10 Evaluate
 $\frac{2}{3} \operatorname{cosec}^2 58^\circ - \frac{2}{3} \cot 58^\circ \tan 32^\circ - \frac{5}{3} \tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$ (3)
- Q.11 If $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$, Prove that $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$ (3)
- Q.12 On dividing the polynomial $4x^4 - 5x^3 - 39x^2 - 46x - 2$ by the polynomial $g(x)$, the quotient and remainder were $x^2 - 3x - 5$ and $-5x + 8$ respectively. Find $g(x)$. (3)
- Q.13 Draw the graphs of the following equations
 $3x + y - 5 = 0$
 $2x - y - 5 = 0$
From the graph, find the points where the lines intersect y-axis. (3)

Section D

Q.14 Obtain all other zeroes of the polynomial $x^4 - 3x^3 - x^2 + 9x - 6$, if two of its zeroes are $\sqrt{3}$ and $-\sqrt{3}$. (4)

Q.15 A two digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number. (4)

Q.16 In an acute angled triangle ABC if $\sin (A + B - C) = \frac{1}{2}$ and $\cos (B + C - A) = \frac{1}{\sqrt{2}}$, find all the angles A, B and C. (4)