

Class X

Real Numbers and Polynomials

1. Show that $5 - \sqrt{3}$ is an irrational number.
2. Show that $7\sqrt{3}$ is an irrational number.
3. Show that $5 - 2\sqrt{3}$ is an irrational number.
4. Show that $3 + 2\sqrt{5}$ is an irrational number.
5. Show that $6 + \sqrt{2}$ is an irrational number.
6. Write two rational numbers between $\sqrt{2}$ and $\sqrt{3}$.
7. Fancy rubber bands are being sold in packets of 24 each and fancy hair pins in packets of 32 each. If we want full packets of both with same number of fancy rubber bands and fancy hair pins, how many of each do we need to buy?
8. Use Euclid's division algorithm to find H.C.F. of
 - (i) 286 and 1035
 - (ii) 82 and 396
 - (iii) 15 and 10945
 - (iv) 960 and 432
9. Prove that $\sqrt{3}$ is an irrational number.
10. Show that $\sqrt{2}$ is an irrational number.
11. Show that one and only one out of n , $n+2$ and $n+4$ is divisible by 3, where n is any positive integer.
12. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, where q is some integer.
13. Show that every positive even integer is of the form $2q$ and that every positive odd integer is of the form $2q + 1$, where q is some integer.
14. Prove that $n^3 - n$ is divisible by 6, for any positive integer n .
15. Show that square of any positive odd integer is of the form $8m + 1$, for some integer m .
16. Use Euclid's division lemma to show that the square of any positive integer is either of the form $3m$ or $3m + 1$ for some integer m .
17. Show that polynomial $x^2 - 4x - 5$ has the zeroes as $x = 5$ and $x = -1$.
18. If $(x + a)$ is a factor of $2x^2 + 2ax + 5x + 10$, then find a .
19. For what value of p , (-4) is a zero of the polynomial $x^2 - 2x - (7p + 3)$.
20. Form a quadratic polynomial whose zeroes are 2 and -3.
21. Form a quadratic polynomial whose zeroes are 6 and -3.

22. Form a quadratic polynomial whose zeroes are $\sqrt{3}$ and $-\sqrt{3}$.
23. Find the quadratic polynomial whose sum of zeroes is 3 and their product is -5.
24. Find the quadratic polynomial whose sum of zeroes is $\sqrt{2}$ and their product is $-3\sqrt{2}$.
25. Find the quadratic polynomial whose sum of zeroes is 0 and their product is $\sqrt{5}$.
26. Find the quadratic polynomial whose sum of zeroes is 1 and their product is 1.
27. Find the quadratic polynomial whose sum of zeroes is 4 and their product is 1.
28. Find the quadratic polynomial whose sum of zeroes is -3 and their product is -5.
29. Write the zeroes of the polynomial $x^2 + 2x + 1$.
30. If the product of the zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value a.
31. Does point (1, -2) lie on the graph of the polynomial $-3x^2 + 2x + 1$.
32. Find the zeroes of the quadratic polynomial $x^2 - 13x + 42$ and verify the relation between zeroes of the polynomial and its coefficient.
33. Find the zeroes of the quadratic polynomial $x^2 + 4x - 192$ and verify the relation between zeroes of the polynomial and its coefficient.
34. Find the zeroes of the quadratic polynomial $4x^2 + 11x - 20$ and verify the relation between zeroes of the polynomial and its coefficient.
35. Find the zeroes of the quadratic polynomial $5x^2 - 32x + 12$ and verify the relation between zeroes of the polynomial and its coefficient.
36. Find the zeroes of the quadratic polynomial $4x^2 - 17x - 21$ and verify the relation between zeroes of the polynomial and its coefficient.
37. Find the zeroes of the quadratic polynomial $x^2 - 14x - 51$ and verify the relation between zeroes of the polynomial and its coefficient.
38. Find the zeroes of the quadratic polynomial $6 - 35a - 6a^2$ and verify the relation between zeroes of the polynomial and its coefficient.
39. Find the zeroes of the quadratic polynomial $6x^2 - x - 2$ and verify the relation between zeroes of the polynomial and its coefficient.
40. Find the zeroes of the quadratic polynomial $1 - 8a + 16a^2$ and verify the relation between zeroes of the polynomial and its coefficient.
41. Find the zeroes of the quadratic polynomial $4x^2 - 17x - 21$ and verify the relation between zeroes of the polynomial and its coefficient.
42. Find the quadratic polynomial, sum of whose zeroes is 8 and their product is 12. Hence find the zeroes of the polynomial.
43. Check whether first polynomial is a factor of the second polynomial given below, by applying division algorithm: $t^2 - 3$; $2t^4 + 3t^3 - 2t^2 - 9t - 12$
44. 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 $-\sqrt{2}$.

45. Divide the polynomial $x^4 - 5x + 6$ by the polynomial $2 - x^2$ and check division algorithm.
46. Divide the polynomial $x^4 + 1$ by the polynomial $x + 1$ and check division algorithm.
47. Divide the polynomial $x^3 - 2x^2 + 3x - 18$ by the polynomial $x - 3$ and check division algorithm.
48. Find all the zeroes of $x^4 + x^3 - 34x^2 - 4x + 120$, if it is known that two of its zeroes are 2 and -2 .
49. Find all the zeroes of $x^4 - 3x^3 + 6x - 4$, if it is known that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.
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