

1. If n is a non negative integer, then $a_n x^n + \dots + a_1 x + a_0$ is a

- (a) polynomial of degree 2
- (b) polynomial of degree 0
- (c) polynomial of degree 3
- (d) polynomial of degree n

Answer: (d) polynomial of degree n

2. What are the two consecutive even integers whose squares have sum 340?

- (a) 12 and 10
- (b) -12 and -14
- (c) 12 and 14
- (d) Both (b) and (c)

Answer: (d) Both (b) and (c)

3. The length of a hypotenuse of a right triangle exceeds the length of its base by 2 cm and exceeds twice the length of the altitude by 1 cm. Find the length of each side of the triangle (in cm) :

- (a) 6, 8, 10
- (b) 7, 24, 25
- (c) 8, 15, 17
- (d) 7, 40, 41

Answer: (c) 8, 15, 17

4. The roots of $x^2 - 8x + 12 = 0$, are

- (a) $x = 0$
- (b) no real roots
- (c) real and unequal
- (d) real and equal

Answer: (c) real and unequal

5. Which of the following equations has the sum of its roots as 3?

- (a) $3x^2 - 3x + 3 = 0$
- (b) $2x^2 - 3x + 6 = 0$
- (c) $-x^2 + 3x - 3 = 0$
- (d) $x^2 + 5x + 6 = 0$

Answer: (c) $-x^2 + 3x - 3 = 0$

6. If the equation $(3x)^2 + (27 \times 3^{1/k} - 15)x + 4 = 0$ has equal roots, then $k =$

(a) -2

(b) $-1/2$

(c) $1/2$

(d) 0

Answer: (b) $-1/2$

7. The solution of $5z^2 = 3z$ is

(a) $0, 3/5$

(b) $0, -3/5$

(c) $3/5$

(d) 0

Answer: (a) $0, 3/5$

8. Determine k such that the quadratic equation $x^2 + 7(3 + 2k) - 2x(1 + 3k) = 0$ has equal roots :

(a) $2, 7$

(b) $7, 5$

(c) $2, -10/9$

(d) None of these

Answer: (c) $2, -10/9$

9. The condition for equation $ax^2 + bx + c = 0$ to be quadratic is

(a) $a < 0$

(b) $a \neq 0$

(c) $a \neq 0, b \neq 0$

(d) $a > 0$

Answer: (b) $a \neq 0$

10. Which of the following equations has 2 as a root?

(a) $x^2 - 4x + 5 = 0$

(b) $x^2 + 3x - 12 = 0$

(c) $2x^2 - 7x + 6 = 0$

(d) $3x^2 - 6x - 2 = 0$

Answer: (c) $2x^2 - 7x + 6 = 0$

11. Find the two consecutive odd positive integers, sum of whose square is 290

(a) 15, 17

(b) 9, 11

(c) 13, 15

(d) 11, 13

Answer: (d) 11, 13

12. If the area of a rectangle is 24 m² and its perimeter is 20 m, the equation to find its length and breadth would be:

(a) $x^2 - 10x + 24 = 0$

(b) $x^2 + 12x + 24 = 0$

(c) $x^2 - 10x - 24 = 0$

(d) $x^2 + 10x + 28 = 0$

Answer: (a) $x^2 - 10x + 24 = 0$

13. The equation $x^2 - px + q = 0$, $p, q \in \mathbb{R}$ has no real roots if :

(a) $p^2 > 4q$

(b) $p^2 < 4q$

(c) $p^2 = 4q$

(d) None of these

Answer: (b) $p^2 < 4q$

14. Write the general form of a quadratic polynomial

(a) $ax^2 + bx + c$ where a, b and c are real numbers

(b) $ax^2 + bx + c = 0$

(c) $ax^2 + bx + c$ where a, b and c are real numbers and a is not equal to zero.

(d) $ax^2 + bx + c$ or $bx + ax^2 + c$ or $c + bx + ax^2$

Answer: (c) $ax^2 + bx + c$ where a, b and c are real numbers and a is not equal to zero.

15. Which of the following quadratic expression can be expressed as a product of real linear factors?

(a) $x^2 - 2x + 3$

(b) $3x^2 - \sqrt{2}x - \sqrt{3}$

(c) $\sqrt{2}x^2 - \sqrt{5}x + 3$

(d) None of these

Answer: (b) $3x^2 - \sqrt{2}x - \sqrt{3}$

16. The two positive numbers differ by 5 and square of their sum is 169 are

(a) 2,4

(b) 5,6

(c) 4,9

(d) 3,7

Answer: (c) 4,9

17. -3 is a root of the quadratic equation $2x^2 + px - 15 = 0$. For what value of q , the equation $p(x^2 + x) + q = 0$ has equal roots?

(a) $1/4$

(b) 2

(c) 14

(d) $1/2$

Answer: (a) $1/4$

18. Comment on the nature of the roots of the equation $7x^2 - 3x - 2 = 0$

(a) Real and distinct roots

(b) Real and equal roots

(c) Imaginary roots

(d) None of the these

Answer: (a) Real and distinct roots

19. If $ax^2 + bx + c$, $a \neq 0$ is factorizable into product of two linear factors, then roots of $ax^2 + bx + c = 0$ can be found by equating each factor to

(a) 2

(b) -1

(c) 0

(d) 1

Answer: (c) 0

20. The length of the plot in meters is 1 more than twice its breadth and the area of a rectangle plot is 528m^2 . Which of the following quadratic equations represents the given situation:

(a) $x^2 + 2x - 528 = 0$

(b) $2x^2 + x - 528 = 0$

(c) $2x^2 + x + 528 = 0$

(d) $x^2 + x - 528 = 0$

Answer: (b) $2x^2 + x - 528 = 0$

21. The real values of a for which the quadratic equation $2x^2 - (a^3 + 8a - 1)x + a^2 - 4a = 0$ possesses roots of opposite signs are given by :

- (a) $a > 6$
- (b) $a > 9$
- (c) $0 < a < 4$
- (d) $a < 0$

Answer: (c) $0 < a < 4$

22. Discriminant of the equation $-3x^2 + 2x - 8 = 0$ is

- (a) -92
- (b) -29
- (c) 39
- (d) 49

Answer: (a) -92

23. Which of the following equations has 2 as a root?

- (a) $2x^2 - 7x + 6 = 0$
- (b) $x^2 + 3x - 12 = 0$
- (c) $3x^2 - 6x - 2 = 0$
- (d) $x^2 - 4x + 5 = 0$

Answer: (a) $2x^2 - 7x + 6 = 0$

24. The sum of areas of two squares is 468m^2 . If the difference of their perimeters is 24m , then the sides of the two squares are:

- (a) 12m and 18m
- (b) 24m and 28
- (c) 6m and 12m
- (d) 18m and 24m

Answer: (a) 12m and 18m

Question 1.

Which of the following is a quadratic equation?

- (a) $x^2 + 2x + 1 = (4 - x)^2 + 3$
- (b) $-2x^2 = (5 - x)[2x - 25]$
- (c) $(k + 1)x^2 + 32x = 7$, where $k = -1$
- (d) $x^3 - x^2 = (x - 1)^3$

Answer: (d) $x^3 - x^2 = (x - 1)^3$

Question 2.

Which of the following is not a quadratic equation?

(a) $2(x - 1)^2 = 4x^2 - 2x + 1$

(b) $2x - x^2 = x^2 + 5$

(c) $(\sqrt{2x} + \sqrt{3})^2 + x^2 = 3x^2 - 5x$

(d) $(x^2 + 2x)^2 = x^4 + 3 + 4x^3$

Answer: (c) $(\sqrt{2x} + \sqrt{3})^2 + x^2 = 3x^2 - 5x$

Question 3.

Which of the following equations has 2 as a root?

(a) $x^2 - 4x + 5 = 0$

(b) $x^2 + 3x - 12 = 0$

(c) $2x^2 - 7x + 6 = 0$

(d) $3x^2 - 6x - 2 = 0$

Answer: (c) $2x^2 - 7x + 6 = 0$

Question 4.

If 12 is a root of the equation $x^2 + kx - 54 = 0$ then the value of k is

(a) 2

(b) -2

(c) 14

(d) 12

Answer: (a) 2

Question 5.

Which of the following has the sum of its roots as 3?

(a) $2x^2 - 3x + 6 = 0$

(b) $-x^2 + 3x + 3 = 0$

(c) $\sqrt{2x^2} - 3\sqrt{2x} + 1 = 0$

(d) $3x^2 - 3x + 3 = 0$

Question 6.

Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is

(a) 0 only

(b) 4

(c) 8 only

(d) 0, 8

Answer: (d) 0, 8

Question 7.

Which constant must be added and subtracted to solve the quadratic equation $9x^2 + 34x - \sqrt{2} = 0$ by the method of completing the square?

- (a) 18
- (b) 164
- (c) 14
- (d) 964

Answer: (b) 164

Question 8.

The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has

- (a) two distinct real roots
- (b) two equal real roots
- (c) no real roots
- (d) more than 2 real roots

Answer: (c) no real roots

Question 9.

Which of the following equations has two distinct real roots?

- (a) $2x^2 - 3\sqrt{2}x + 94 = 0$
- (b) $x^2 + x - 5 = 0$
- (c) $x^2 + 3x + 2\sqrt{2} = 0$
- (d) $5x^2 - 3x + 1 = 0$

Answer: (b) $x^2 + x - 5 = 0$

Question 10.

Which of the following equations has no real roots?

- (a) $x^2 - 4x + 3\sqrt{2} = 0$
- (b) $x^2 + 4x - 3\sqrt{2} = 0$
- (c) $x^2 - 4x - 3\sqrt{2} = 0$
- (d) $3x^2 + 4\sqrt{3} + 4 = 0$

Answer: (a) $x^2 - 4x + 3\sqrt{2} = 0$

Question 11.

$(x^2 + 1)^2 - x^2 = 0$ has

- (a) four real roots
- (b) two real roots
- (c) no real roots
- (d) one real roots

Answer: (c) no real roots