

4. QUADRATIC EQUATIONS

1. Solve:

$$\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0$$

2. Solve:

$$abx^2 + (b^2 - ac)x - bc = 0$$

3. Find the value of p for which the quadratic equations have real roots:

(i) $2x^2 + 3x + p = 0$

(ii) $5px^2 - 8x + 2 = 0$

(iii) $2x^2 + px + 8 = 0$

4. Find if the equation has repeated roots.

$$9z^2 - 6z + 4 = 0$$

5. Factorize the following quadratic polynomial

$$2\sqrt{2}x^2 + 4x + \sqrt{2} = 0$$

6. Solve by reducing to quadratic equation:

(i) $\left(\frac{2x-3}{x-1}\right)^2 - 4\left(\frac{x-1}{2x-3}\right) = 3, \quad x \neq 1, x \neq \frac{3}{2}$

(ii) $6\left(\frac{y-3}{2y+1}\right) + 1 = 5\sqrt{\frac{y-3}{2y+1}}, \quad y \neq -\frac{1}{2}$

(iii) $\left(x + \frac{1}{x}\right)^2 = 4 + \frac{3}{2}\left(x - \frac{1}{x}\right), \quad x \neq 0$

(iv) $x(x+5)(x+7)(x+12) + 150 = 0$

(v) $3^{x+2} + 3^{-x} = 10$

(vi) $\sqrt{4-x} + \sqrt{x+9} = 5$

(viii) $\left(\frac{2x}{x-5}\right)^2 + \left(\frac{6x}{x-5}\right) = 18, \quad x \neq 5$

7. The product of two successive integral multiples of 5 is 300. Find the multiples.
8. The hypotenuse of a right-angled triangle is 25 m long. The difference between the lengths of the other two sides is 5 m. Find the lengths, of the other sides of the triangle.
9. If I had walked 1 km per hour faster, I would have taken 10 minutes less to walk 2 km. Find the rate of my walking.
10. One-fourth of a herd of camels was seen in forest. Twice the square root of the herd had gone to mountain and remaining 15 camels were on the bank of the river, Find the total number of camels.
11. In a flight of 1600 km an aircraft was slowed down by bad weather. Its average speed for a trip was reduced by 400 km/h and the time of flight increased by 40 minutes. Find the actual time of flight.

12. A boy's age and that of his father together amount to 24 years. The fourth part of the product of the ages exceeds the boy's age by 9 years, find how old are they?
13. If one root of the quadratic equation $x^2 + px + 4 = 0$ is 2. Find the other root and value of p.
14. If α and β are the roots of the quadratic equation $3x^2 + 8x + 2 = 0$, find the values of
- (i) $\alpha^2 + \beta^2$ (ii) $\alpha^3 + \beta^3$

TutorBreeze.com

ANSWERS

1. $x = -1$
2. $c/b, -b/a$
3. (i) $p \leq 1\frac{1}{8}$
(ii) $p \leq 1\frac{3}{5}$
(iii) $p \geq 8$ or $p \leq -8$
4. No
5. $\sqrt{2}(\sqrt{2}x+1)^2$
6. (i) $\left\{\frac{1}{2}, \frac{4}{3}\right\}$
(ii) $\left\{\frac{13}{2}, 4\right\}$
(iii) $\left\{-1, -\frac{1}{2}, 1, 2\right\}$
(iv) $-6 \pm \sqrt{31}, -6 \pm 6\sqrt{6}$
(v) $x = -2, x = 0$
(vi) $x = 0, -5$
(vi) $x = 0, -5$
(vii) 4,5
(vii) 15, 15/4
7. 15 and 20 or -15 and -20
8. 15, 20
9. 3 km/h
10. 36
11. 4/3 hours
12. $p = -4$, other root = 2
13. $p = -4$, other root = 2
14. (i) 52/9 (ii) -368/27