# MATHS

# BOOKS - NCERT MATHS (ENGLISH)

# QUADRIATIC EQUATIONS

## Mcq Type

**1.** Which of the following is a quadratic equation?

A. $x^2 + 2x + 1 = (4 - x)^2 + 3$

B. $-2x^2 = (5 - x)\left(2x - \dfrac{2}{5}\right)$

C. $(k + 1)x^2 + \dfrac{3}{2}x = 7$, where $k = -1$

D. $x^3 - x^2 = (x - 1)^3$

**Answer: D**

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**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. $\left(\sqrt{2}x + \sqrt{3}\right)^2 = 3x^2 - 5x$

D. $\left(x^2 + 2x\right)^2 = x^4 + 3 + 4x^2$

**Answer: D**

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**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**

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**4.** If $\dfrac{1}{2}$ is a root of the equation $x^2 + kx - \dfrac{5}{4} = 0$, then find the value of k.

A. 2

B. $-2$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{2}$

**Answer: A**

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

(a)$x^2 + 3x - 5 = 0$

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

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

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

A. $2x^2 - 3x + 6 = 0$

B. $-x^2 + 3x - 3 = 0$

C. $\sqrt{2}x^2 - \dfrac{3}{\sqrt{2}}x + 1 = 0$

D. $3x^2 - 3x + 3 = 0$

Answer:

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**6.** Value(s) of $k$ for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is/are

A. $0$

B. $4$

C. $8$

D. $0, 8$

**Answer:** $D$

**7.** Which constant must be added and subtracted to solve the quadratic equation $9x^2 + \dfrac{3}{4}x - \sqrt{2} = 0$ by the method of completing the square?

A. $\dfrac{1}{8}$

B. $\dfrac{1}{64}$

C. $\dfrac{1}{4}$

D. $\dfrac{9}{64}$

**Answer: B**

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**8.** What is the nature of roots of the quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$?

A. two distinct real roots

B. two equal real roots

C. no real roots

D. more than 2 real roots

**Answer: C**

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**9.** Which of the following equations has two distinct real roots?

A. $2x^2 - 3\sqrt{2}x + \dfrac{9}{4} = 0$

B. $x^2 + x - 5 = 0$

C. $x^2 + 3x + 2\sqrt{2} = 0$

D. $5x^2 - 3x + 1 = 0$

**Answer: B**

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**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. $3x^2 + 4\sqrt{3}x + 4 = 0$

**Answer:** $A$

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**11.** Show that $\left(x^2 + 1\right)^2 - x^2 = 0$ has no real roots.

A. four real roots

B. two real roots

C. no real roots

D. one real root

**Answer:**

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**1.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$x^2 - 3x + 4 = 0$$

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**2.** State whether the following quadratic equations have two distinct real roots. Justicy

your answer:

$$2x^2 + x - 1 = 0$$

**3.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$2x^2 - 6x + \frac{9}{2} = 0$$

**4.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$3x^2 - 4x + 1 = 0$$

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**5.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$(x + 4)^2 - 8x = 0$$

**6.** State whether the following quadratic equations have two distinct real roots. Justicy your answer: $\left(x - \sqrt{2}\right)^2 - 2(x + 1) = 0$

**7.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + \frac{1}{\sqrt{2}} = 0$$

**8.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

$$x(1 - x) - 2 = 0$$

**9.** State whether the following quadratic equations have two distinct real roots. Justicy

your answer:

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

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**10.** State whether the following quadratic equations have two distinct real roots. Justicy your answer:

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

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**11.** Write whether the following statements are true or false. Justify your answers.

(i) Every quadratic equation has exactly one root.

(ii) Every quadratic equation has atleast one real root.

(ii) Every quadratic equation has atleast two roots.

(iv) Every quadratic equations atmost two roots.

(v) If he coefficient of $x^2$ and the constnat term of a quadratic equation have opposite

sigh, then the quadratic equation has real roots.

(vi) If the coefficient of $x^2$ and the constant term have the same sign and if the coefficient of $x$ term is zero, then the quadratic equation has no real roots.

**12.** A quadratic equation with integral coefficients has integral roots. Justify your answer.

**13.** Does there exist a quadratic equation whose coefficients are rational but both of its roots are irrational? Justify you answer.

**14.** Does there exist a quadratic equation whose coefficients are all distinct irrationals but both the roots are rationals?

**15.** Is 0.2 a root of the equation $x^2 - 0.4 = 0$?

Justify your answer.

**16.** If $b = 0, c < 0,$ is it true that the roots of $x^2 + bx + c = 0$ are numerically equal and opposite in sign? Justify your answer.

1. Find the roots of the quadratic equations by using the quadratic formula

$$2x^2 - 3x - 5 = 0$$

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2. Find the roots of the quadratic equations by using the quadratic formula

$$5x^2 + 13x + 8 = 0$$

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**3.** Find the roots of the quadratic equations by using the quadratic formula

$$-3x^2 + 5x + 12 = 0$$

**4.** Find the roots of the quadratic equations by using the quadratic formula

$$-x^2 + 7x - 10 = 0$$

**5.** Salve the following quadratic equations by factorization method. $x^2 + 2\sqrt{2}x - 6 = 0$

$\sqrt{3}x^2 + 10x = 7\sqrt{3} = 0$

**6.** . Find the roots of the following quadratic equation : $x^2 - 3\sqrt{5}x + 10 = 0$

**7.** Find the roots of the quadratic equations by using the quadratic formula

$$\frac{1}{2}x^2 - \sqrt{11}x + 1 = 0$$

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**8.** Find the roots of the following quadratic equations by the factorisation method.

$$2x^2 + \frac{5}{3}x - 2 = 0$$

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**9.** Find the roots of the following quadratic equations by the factorisation method.

$$\frac{2}{5}x^2 - x - \frac{3}{5} = 0$$

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**10.** Find the roots of the following quadratic equations by the factorisation method.

$$3\sqrt{2}x^2 - 5x - \sqrt{2} = 0$$

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**11.** Find the roots of the following quadratic equations by the factorisation method.

$$3x^2 + 5\sqrt{5}x - 10 = 0$$

**12.** Find the roots of the following quadratic equations by the factorisation method.

$$21x^2 - 2x + \frac{1}{21} = 0$$

**1.** Find whether the following equations have real roots. If real roots exist, find them

$$8x^2 + 2x - 3 = 0$$

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**2.** Find whether the following equations have real roots. If real roots exist, find them

$$-2x^2 + 3x + 2 = 0$$

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**3.** Find whether the following equations have real roots. If real roots exist, find them

$$5x^2 - 2x - 10 = 0$$

**4.** Find whether the following equations have real roots. If real roots exist, find them

$$\frac{1}{2x - 3} + \frac{1}{x - 5} = 1, x \neq \frac{3}{2}, 5$$

**5.** Find whether the following equations have real roots. If real roots exist, find them

$$x^2 + 5\sqrt{5}x - 70 = 0$$

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**6.** Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.

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**7.** A natural number, when increased by 12, becomes equal to 160 times its reciprocal. Find the number.

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**8.** A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train.

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**9.** If Zeba were younger by $5$ years than what she really is, then the square of her age (in years) would have been $11$ more than five times her actual age. What is her age now?

**10.** At present Asha's age (in years) is $2$ more than the square of her daughter Nisha's age. When Nisha grows to her mother's present

age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.

**11.** In the centre of a rectangular lawn of dimensions $50\,m \times 40\,m$ a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 $m^2$ Find the length and breadth of the pond

**12.** At t minutes past 2 pm, the time needed by the minutes hand of a clock to show 3pm was found to be 3 minutes less than $(t^2)/4$ minutes. Find t.

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