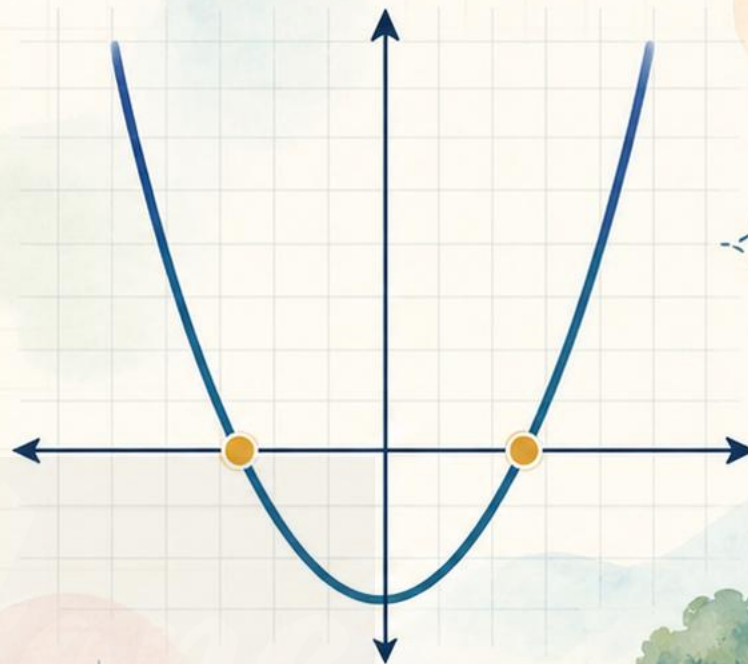


MATHEMATICS • CLASS 10

CHAPTER 4

Quadratic Equations

NCERT SOLUTIONS



EXERCISE 4.1 – Q1 (i) & (ii)

Q1. Check whether the equations are quadratic. Simplify first, then check the highest power of x .

(i) $(x + 1)^2 = 2(x - 3)$

Expand both sides:

$$x^2 + 2x + 1 = 2x - 6$$

Bring all terms to the left:

$$x^2 + 2x + 1 - 2x + 6 = 0$$

$$x^2 + 7 = 0$$

The highest power is 2, and its coefficient is non-zero.

Answer: Yes, it is a quadratic equation.

(ii) $x^2 - 2x = (-2)(3 - x)$

Expand the right side:

$$x^2 - 2x = -6 + 2x$$

Bring all terms to the left:

$$x^2 - 2x + 6 - 2x = 0$$

$$x^2 - 4x + 6 = 0$$

The highest power is 2.

Answer: Yes, it is a quadratic equation.

EXERCISE 4.1 — Q1 (iii) & (iv)

Q1. Check whether the equations are quadratic.

$$(iii) (x-2)(x+1) = (x-1)(x+3)$$

Expand:

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

Cancel x^2 on both sides:

$$-x - 2 = 2x - 3$$

$$-3x + 1 = 0$$

The highest power is 1, not 2.

Answer: No. It simplifies to a linear equation.

$$(iv) (x-3)(2x+1) = x(x+5)$$

Expand:

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

Bring all terms to the left:

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

$$x^2 - 10x - 3 = 0$$

The highest power is 2.

Answer: Yes, it is a quadratic equation.

EXERCISE 4.1 — Q1 (v) & (vi)

Q1. Check whether the equations are quadratic.

(v) $(2x-1)(x-3) = (x+5)(x-1)$

Expand:

$$2x^2 - 7x + 3 = x^2 + 4x - 5$$

Bring all terms to the left:

$$2x^2 - 7x + 3 - x^2 - 4x + 5 = 0$$

$$x^2 - 11x + 8 = 0$$

The highest power is 2.

Answer: Yes, it is a quadratic equation.

(vi) $x^2 + 3x + 1 = (x-2)^2$

Expand the right side:

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

Cancel x^2 on both sides:

$$3x + 1 = -4x + 4$$

$$7x - 3 = 0$$

The highest power is 1.

Answer: No. It simplifies to a linear equation.

EXERCISE 4.1 – Q1 (vii) & (viii)

Q1. Check whether the equations are quadratic.

(vii) $(x + 2)^3 = 2x(x^2 - 1)$

Expand both sides:

$$x^3 + 6x^2 + 12x + 8 = 2x^3 - 2x$$

Bring all terms to the left:

$$-x^3 + 6x^2 + 14x + 8 = 0$$

The highest power is 3.

Answer: No. It is a cubic equation.

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

Expand the right side:

$$x^3 - 4x^2 - x + 1 = x^3 - 6x^2 + 12x - 8$$

Cancel x^3 and collect terms:

$$2x^2 - 13x + 9 = 0$$

The highest power is now 2.

Answer: Yes, it is a quadratic equation.

Always simplify before deciding the degree.



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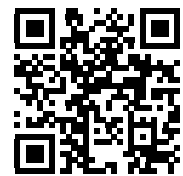


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