

Quadratic Equations - Exercise 4.3

Exercise 4.3 with independently verified solutions.

CHAPTER

Quadratic Equations

RESOURCE

NCERT Exercises

SOURCE

NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

QUESTION

Question 1

discriminant · nature of roots · quadratic formula

Find the nature of the roots; if real roots exist, find them.

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

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

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

Solution

1. $D = (-3)^2 - 4(2)(5) = -31 < 0$

No real roots.

2. $D = (-4\sqrt{3})^2 - 4(3)(4) = 0$

$$x = \frac{4\sqrt{3}}{6} = \frac{2\sqrt{3}}{3}$$

Two equal real roots.

3.

$$D = (-6)^2 - 4(2)(3) = 12 > 0$$

$$x = \frac{6 \pm \sqrt{12}}{4} = \frac{3 \pm \sqrt{3}}{2}$$

Two distinct real roots.

QUESTION

Question 2

discriminant · equal roots

Find k so that each equation has two equal roots.

1.

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

2.

$$kx(x - 2) + 6 = 0$$

Solution

1.

$$D = k^2 - 24 = 0 \Rightarrow k = \pm 2\sqrt{6}$$

2.

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

$$D = 4k^2 - 24k = 4k(k - 6) = 0$$

k = 0 would make the equation non-quadratic, so k = 6.

QUESTION

Question 3

nature of roots · word problem · rectangle

Can a rectangular mango grove have length twice its breadth and area 800 m²?
If so, find its dimensions.

Solution

Let breadth = x m and length = $2x$ m.

$$2x^2 = 800 \Rightarrow x^2 - 400 = 0$$

$$x = 20 \text{ or } -20$$

A breadth cannot be negative, so $x = 20$ m; length = 40 m. Their product is 800 m^2 .

Final answer

Yes; breadth 20 m and length 40 m.

QUESTION

Question 4

nature of roots · word problem · ages

Two friends' present ages sum to 20 years. Four years ago, the product of their ages was 48 . Is this possible?

Solution

Let one present age be x years; the other is $20 - x$.

$$(x - 4)(16 - x) = 48 \Rightarrow x^2 - 20x + 112 = 0$$

$$D = (-20)^2 - 4(1)(112) = -48 < 0$$

There are no real ages satisfying the conditions, so the situation is not possible.

Final answer

No, the stated situation is not possible.

QUESTION

Question 5

nature of roots · word problem · rectangle

Can a rectangular park have perimeter 80 m and area 400 m²? If so, find its dimensions.

Solution

Let one side be x m. Since length + breadth = 40 m, the other side is $40 - x$.

$$x(40 - x) = 400 \Rightarrow x^2 - 40x + 400 = 0$$

$$D = (-40)^2 - 4(1)(400) = 0$$

$$x = \frac{40}{2} = 20$$

The equal roots give a 20 m by 20 m square; its perimeter and area verify both conditions.

Final answer

Yes; 20 m × 20 m.