

Name: _____

Completing the Square - Step by Step Worksheet

Solved: $x^2 + 3x - 1 = 3$

Step - 1

Rearrange if possible
& identify 'b'

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

$$\Rightarrow x^2 + 3x - 1 + 1 = 3 + 1$$

$$\Rightarrow x^2 + 3x = 4, \text{ here } b = 3$$

Step - 2

Add $\left(\frac{b}{2}\right)^2$ to both sides

$$\left(-\frac{3}{2}\right)^2 = \frac{9}{4}$$

$$\Rightarrow x^2 + 3x + \frac{9}{4} = 4 + \frac{9}{4}$$

$$\Rightarrow \left(x + \frac{3}{2}\right)^2 = \frac{16 + 9}{4}$$

Step - 3

Factor and solve

$$\left(x + \frac{3}{2}\right)^2 = \frac{16 + 9}{4}$$

$$\Rightarrow \left(x + \frac{3}{2}\right)^2 = \frac{25}{4}$$

$$\Rightarrow \left(x + \frac{3}{2}\right)^2 = \left(\frac{5}{2}\right)^2$$

$$\Rightarrow x + \frac{3}{2} = \pm \frac{5}{2}$$

$$\Rightarrow x = -\frac{3}{2} \pm \frac{5}{2}$$

$$\Rightarrow \underline{x = (1, -4)}$$

Solve the given quadratic equations in a step by step fashion.

① $5x^2 - 20x - 60 = 0$

② $5x^2 - 50x + 85 = 0$

③ $2x^2 - 4x - 8 = 0$

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Answers

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Step - 2

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Factor and solve

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Solve the given quadratic equations in a step by step fashion.

① $5x^2 - 20x - 60 = 0$

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③ $2x^2 - 4x - 8 = 0$

(6, -2)

(5 + 2√2, 5 - 2√2)

(1 + √5, 1 - √5)