

19.0

2 CST items

Students know the quadratic formula and are familiar with its proof by completing the square.

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Key Vocabulary

Quadratic

Quadratic Formula

Proof

Complete the Square

Instructional Objectives

1 Prove the quadratic formula.

1 Arrange the following steps in the correct order to solve the quadratic by completing the square.

Step ___: $3x^2 - 36x + 60 = 0$

Step ___: $x = 10$ or $x = 2$

Step ___: $(x - 6)^2 = 16$

Step ___: $x - 6 = \pm 4$

Step ___: $3x^2 - 36x = -60$

Step ___: $x = 6 + 4$ or $x = 6 - 4$

Step ___: $x^2 - 12x + 36 = -20 + 36$

Step ___: $\sqrt{(x - 6)^2} = \sqrt{16}$

Step ___: $x^2 - 12x = -20$

2 Arrange the following steps to the proof of the quadratic formula in the correct order.

Step ___: $ax^2 + bx + c = 0$

Step ___: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Step ___: $\sqrt{\left(x + \frac{b}{2a}\right)^2} = \sqrt{\frac{b^2 - 4ac}{4a^2}}$

Step ___: $x^2 + \frac{b}{a}x + \left(\frac{b}{2a}\right)^2 = \frac{-c}{a} + \left(\frac{b}{2a}\right)^2$

Step ___: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Step ___: $\left(x + \frac{b}{2a}\right)^2 = \frac{-c}{a} + \frac{b^2}{4a^2}$

Step ___: $\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$

Step ___: $ax^2 + bx = -c$

Step ___: $x + \frac{b}{2a} = \pm \frac{\sqrt{b^2 - 4ac}}{2a}$

Step ___: $x^2 + \frac{b}{a}x = \frac{-c}{a}$

Step ___: $\left(x + \frac{b}{2a}\right)^2 = \frac{-4ac}{4a^2} + \frac{b^2}{4a^2}$