

Solve by Completing the Square

$$x^2 = 25$$

$$x = \pm 5$$

$$x = -1 \pm \sqrt{10}$$

$$-\frac{7}{2} + \frac{81}{16}$$

$$-\frac{56}{16} + \frac{81}{16} = \frac{25}{16}$$

$$-\frac{9}{4} + \frac{5}{4} = -\frac{4}{4} = -1$$

$$-\frac{9}{4} - \frac{5}{4} = -\frac{14}{4} = -\frac{7}{2}$$

$$\frac{4}{3} + \frac{16}{36}$$

$$\frac{48}{36} + \frac{16}{36}$$

$$f(x) = x^2 + 2x - 9$$

$$f(x) + 9 = x^2 + 2x + 1$$

$$f(x) + 10 = (x+1)^2$$

$$f(x) = (x+1)^2 - 10$$

$$0 = (x+1)^2 - 10$$

$$\pm \sqrt{10} = \sqrt{(x+1)^2}$$

$$\pm \sqrt{10} = x+1$$

$$x^2 - 4x = 2x + 35$$

$$x^2 - 6x + 9 = 35$$

$$\sqrt{(x-3)^2} = \sqrt{44}$$

$$x-3 = \pm \sqrt{44}$$

$$x = 3 \pm \sqrt{44}$$

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

$$x^2 - \frac{4}{3}x + \frac{16}{9} = \frac{4}{9} + \frac{16}{9}$$

$$\sqrt{\left(x - \frac{4}{6}\right)^2} = \sqrt{\frac{64}{36}}$$

$$x - \frac{4}{6} = \pm \frac{8}{6}$$

$$x = \frac{4}{6} \pm \frac{8}{6}$$

$$x = \frac{4}{6} + \frac{8}{6} \quad x = \frac{4}{6} - \frac{8}{6}$$

$$x = 2 \quad x = -\frac{4}{6} = -\frac{2}{3}$$

$$x^2 - 12x = 28$$

$$x^2 - 12x + 36 = 28 + 36$$

$$\sqrt{(x-6)^2} = \sqrt{64}$$

$$x-6 = \pm 8$$

$$x = 6 \pm 8$$

$$x = 6+8 \quad x = 6-8$$

$$x = 14 \quad x = -2$$

$$\frac{2x^2}{2} + \frac{9x}{2} + \frac{7}{2} = \frac{0}{2}$$

$$x^2 + \frac{9}{2}x + \frac{7}{2} = 0$$

$$x^2 + \frac{9}{2}x + \frac{81}{16} = -\frac{7}{2} + \frac{81}{16}$$

$$\sqrt{\left(x + \frac{9}{4}\right)^2} = \sqrt{\frac{25}{16}}$$

$$x + \frac{9}{4} = \pm \frac{5}{4}$$

$$x = -\frac{9}{4} \pm \frac{5}{4}$$

$$-3x^2 + 24x = 27$$

$$x^2 - 8x + 16 = -9 + 16$$

$$(x-4)^2 = 7$$

$$x-4 = \pm \sqrt{7}$$

$$x = 4 \pm \sqrt{7}$$

$$x = -1$$

$$x = -\frac{7}{2}$$

Quadratic Formula

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

OR

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

$$\frac{7}{18} \pm \frac{\sqrt{193}}{18}$$

$$\frac{-6}{16} \pm \frac{\sqrt{-124}}{16}$$

No Real Solution

Complex Numbers

$$ax^2 + bx + c$$

Solve each using the quadratic formula.

$$a=2 \quad b=-3 \quad c=-5$$

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

$$\frac{3}{2(2)} \pm \frac{\sqrt{(-3)^2 - 4(2)(-5)}}{2(2)}$$

$$\frac{3}{4} \pm \frac{\sqrt{9 - (-40)}}{4}$$

$$\frac{3}{4} \pm \frac{\sqrt{49}}{4} \quad \frac{3}{4} \pm \frac{7}{4}$$

$$9n^2 = 4 + 7n$$

$$9n^2 - 7n - 4 = 0$$

$$\frac{7}{2(9)} \pm \frac{\sqrt{(-7)^2 - 4(9)(-4)}}{2(9)}$$

$$\frac{7}{18} \pm \frac{\sqrt{49 - (-144)}}{18}$$

$$8a^2 + 6a = -5$$

$$8a^2 + 6a + 5 = 0$$

$$\frac{-6}{2(8)} \pm \frac{\sqrt{6^2 - 4(8)(5)}}{2(8)}$$

$$\frac{-6}{16} \pm \frac{\sqrt{36 - 160}}{16}$$

Simplify each imaginary number.

$$\sqrt{-25}$$

$$\sqrt{-81}$$

$$-\sqrt{-100}$$

$$\pm\sqrt{-36}$$

$$\sqrt{-3}$$

$$2m^2 - 7m - 13 = -10$$

$$2m^2 - 7m - 3 = 0$$

$$\frac{7}{2(2)} \pm \frac{\sqrt{(-7)^2 - 4(2)(-3)}}{2(2)}$$

$$\frac{7}{4} \pm \frac{\sqrt{49 - (-24)}}{4}$$

$$\frac{7}{4} \pm \frac{\sqrt{73}}{4}$$

$$8n^2 + 7n - 15 = -7$$