

Factor Completely

$$x^2 - 12x + 35 \quad \begin{array}{r} 35 \\ -7 \cdot -5 \end{array}$$

$$(x^2 - 7x) + (-5x + 35)$$

$$x(x-7) - 5(x-7)$$

$$(x-7)(x-5)$$

$$6x^2 + 33x - 63 \quad 2 \cdot -21 = -42$$

$$3(2x^2 + 11x - 21)$$

$$-2 \cdot 21$$

$$-21 \cdot 2$$

$$-14 \cdot 3$$

$$\underline{-3 \cdot 14}$$

$$(2x^2 - 3x) + (14x - 21)$$

$$x(2x-3) + 7(2x-3)$$

$$3(2x-3)(x+7)$$

$$4x^2 - 20x + 21 \quad \begin{array}{r} 84 \\ -6 \cdot -14 \end{array}$$

$$(4x^2 - 6x) + (-14x + 21)$$

$$2x(2x-3) - 7(2x-3)$$

$$(2x-3)(2x-7)$$

Solve by factoring

$$x^2 - 4x - 96 = 0$$

$$(x^2 - 12x) + (8x - 96) = 0$$

$$x(x - 12) + 8(x - 12) = 0$$

$$(x + 8)(x - 12) = 0$$

$$x + 8 = 0 \quad x - 12 = 0$$

$$x = -8 \quad x = 12$$

$$\frac{-96}{-48 \cdot 2}$$

$$-2 \cdot 48$$

$$-32 \cdot 3$$

$$-3 \cdot 32$$

$$-24 \cdot 4$$

$$-4 \cdot 24$$

$$-16 \cdot 6$$

$$-6 \cdot 16$$

$$\frac{-12 \cdot 8}{-8 \cdot 12}$$

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

$$(3x^2 - 6x) + (5x - 10) = 0$$

$$3x(x - 2) + 5(x - 2) = 0$$

$$(3x + 5)(x - 2) = 0$$

$$3x + 5 = 0$$

$$3x = -5$$

$$x = \frac{-5}{3}$$

$$x - 2 = 0$$

$$x = 2$$

$$\frac{-30}{-6 \cdot 5}$$

Find the value of the discriminant. Find the number of real or imaginary solutions. If the solutions are real classify them as rational or irrational.

$$b^2 - 4ac$$

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

$$2^2 - 4(6)(1)$$

$$4 - 24$$

$$-20$$

2 imaginary
Solutions

$$3x^2 + 11x + 4 = 0$$

$$11^2 - 4(3)(4)$$

$$121 - 48$$

$$73$$

2 Real Solutions
Irrational

Solve using the quadratic formula. Classify each solution as rational, irrational, or complex. When possible make sure you simplify your radicals.

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

$$x^2 - 16x + 4 = 0$$

$$\frac{16}{2(1)} \pm \frac{\sqrt{16^2 - 4(1)(4)}}{2(1)}$$

$$8 \pm \frac{\sqrt{256 - 16}}{2} \quad \begin{array}{l} \sqrt{240} \\ \sqrt{16} \cdot \sqrt{15} \end{array}$$

$$8 \pm \frac{\sqrt{240}}{2} \quad 4\sqrt{15}$$

$$8 \pm \frac{4\sqrt{15}}{2} \quad \text{Irrational}$$

$$8 \pm 2\sqrt{15}$$

$$x^2 - 6x + 13 = 0$$

$$\frac{6}{2(1)} \pm \frac{\sqrt{(-6)^2 - 4(1)(13)}}{2(1)}$$

$$3 \pm \frac{\sqrt{36 - 52}}{2} \quad \sqrt{-16}$$

$$3 \pm \frac{\sqrt{-16}}{2} \quad \sqrt{16} \cdot \sqrt{-1}$$

$$3 \pm \frac{4i}{2} \quad 4i$$

$$3 \pm 2i$$

Complex

Perform the indicated operation:

$$-4 + 8i - (-2 - i) - 15i$$

$$-4 + 8i + 2 + i - 15i$$

$$-2 - 6i$$

FOIL

$$(2 - 6i)(3 + 2i)$$

$$6 + 4i - 18i - 12i^2$$

$$6 - 14i - 12(-1)$$

$$6 - 14i + 12$$

$$18 - 14i$$

Marsha hits a tennis ball upward from a top a 90 foot cliff with an initial upward velocity of 16 feet per second. Find the time it will take for the ball to hit the ground.

$$h(t) = h_0 + v_0 t - 16t^2$$

$$0 = 90 + 16t - 16t^2$$

$$\frac{-16 \pm \sqrt{16^2 - 4(-16)(90)}}{2(-16)}$$

$$\frac{1 \pm \frac{\sqrt{6016}}{-32}}$$

$$.5 \pm -2.42$$

$$.5 - 2.42 = -1.92$$

$$.5 + 2.42 = 2.92 \text{ sec}$$

