

Algebra I Lesson 9-4

- I can factor trinomials of the form $ax^2 + bx + c$.
- I can solve equations of the form $ax^2 + bx + c = 0$

• $(2x + 5)(3x + 1)$

$$\begin{matrix} F & O & I & L \\ 6x^2 + 2x + 15x + 5 & ax^2 + mx + nx + c \end{matrix}$$

$$\rightarrow 6x^2 + 17x + 5 \quad \boxed{ax^2 + bx + c}$$

$$\left\{ \begin{array}{l} m+n=b \\ mn=ac \end{array} \right.$$

$$\underline{2+15=17} \quad \underline{2 \cdot 15=6 \cdot 5}$$

$$6x^2 + 17x + 5$$

$$m+n=17$$

$$mn=30 \quad (6x^2 + 2x) + (15x + 5)$$

$$2(3x+1) + 5(3x+1)$$

$$(3x+1)(2x+5)$$

$$7x^2 + 22x + 3$$

$$m+n=22$$

$$mn=21$$

$$(7x^2 + 21x) + (x + 3)$$

$$7x(x+3) + 1(x+3)$$

$$(x+3)(7x+1)$$

$$10x^2 - 43x + 28$$

$$10x^2 - 35x - 8x + 28$$

$$5x(2x-7) + -4(2x-7)$$

$$(2x-7)(5x-4)$$

$$3x^2 + 24x + 45$$

$$3(x^2 + 8x + 15)$$

$$\boxed{3(x+3)(x+5)}$$

$$3(x^2 + 5x + 3x + 15)$$

$$3(x^2 + 8x + 15)$$

$$3x^2 + 24x + 45$$

A polynomial that cannot be written as a product of two polynomials with integral coefficients is called a prime polynomial.

$$2x^2 + 5x - 2$$

$$m-n=5$$

$$mn=-4$$

Solve: $8a^2 - 9a - 5 = 4 - 3a$

$$m+n=6$$

$$m-n=6$$

$$mn=72$$

$$\begin{array}{r} 8a^2 - 9a - 5 = 4 - 3a \\ + 3a \qquad \qquad + 3a \\ \hline 8a^2 - 6a - 5 = 4 \\ \qquad \qquad -4 \qquad -4 \\ \hline 8a^2 - 6a - 9 = 0 \end{array}$$

$$(8a^2 - 12a) + (6a - 9) = 0$$

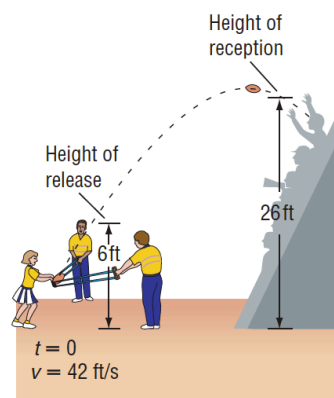
$$4a(2a - 3) + 3(2a - 3) = 0$$

$$(2a - 3)(4a + 3) = 0 \quad \left\{ -\frac{3}{4}, \frac{3}{2} \right\}$$

$$\begin{array}{l} 2a - 3 = 0 \\ 2a = 3 \\ a = \frac{3}{2} \end{array} \quad \begin{array}{l} 4a + 3 = 0 \\ 4a = -3 \\ a = -\frac{3}{4} \end{array}$$

A model for the vertical motion of a projected object is given by the equation $h = -16t^2 + vt + s$, where h is the height in feet, t is the time in seconds, v is the initial upward velocity in feet per second, and s is the starting height of the object in feet.

At a pep rally, small foam footballs are launched by cheerleaders using a sling-shot. How long is a football in the air if a student in the stands catches it on its way down 26 feet above the gym floor?



$$h = -16t^2 + vt + s$$

$$26 = -16t^2 + 42t + 6$$

$$\begin{array}{r} -26 \\ -26 \end{array} \qquad \qquad \qquad \begin{array}{r} -26 \\ -26 \end{array}$$

$$0 = -16t^2 + 42t - 20$$

$$0 = -2(8t^2 - 21t + 10)$$

$$-2(8t^2 - 21t + 10) = 0$$

$$8t^2 - 21t + 10 = 0$$

$$m+n = 21$$

$$mn = 80$$

$$(8t^2 - 16t) + (5t + 10) = 0$$

$$8t(t-2) + -5(t-2) = 0$$

$$(t-2)(8t-5) = 0$$

$$t-2=0 \quad 8t-5=0$$

$$t=2 \quad 8t=5$$

$$t = \frac{5}{8}$$

2 sec

$$2x^2 + Kx + 15$$

$$m+n = K$$

$$mn = 30$$

$$\pm 31$$

$$\pm 11$$

$$\pm 17$$

$$\pm 13$$

$$2x^2 + 12x + K$$

$$m+n = 12$$

$$mn = 2K$$

$$10 \cdot 2 = 20$$

Assignment

Pg. 499 #14-50 even, 51

due Thurs \Rightarrow #14-30 even