

$$x^2 - 3x - 4$$

3 terms

$$y^4 + 11y^2 + 30$$

TRINOMIALS

$$z^2 + 5zy + 6y^2$$

$$m^2 - 8m + 16$$

Expand: (multiply)

$$\begin{array}{l} (x+2)(x+1) \\ \underline{x^2+1x} \quad \underline{+2x+2} \\ \underline{x^2+3x+2} \end{array}$$

$$\begin{array}{l} (x+5)(x-4) \\ \underline{x^2-4x} \quad \underline{+5x-20} \\ \underline{x^2+1x-20} \end{array}$$

$$\begin{array}{l} (x-7)(x-1) \\ \underline{x^2-1x} \quad \underline{-7x+7} \\ \underline{x^2-8x+7} \end{array}$$

Krow sdrawkcab



$$1. \quad x^2 + \underline{19}x + \underline{18} \quad (\text{Simple Trinomial})$$

$$(\underline{x+1})(\underline{x+18})$$

$$\underline{1} + \underline{18} = 19$$

$$\underline{1} \times \underline{18} = 18$$

$$18$$

$$1 \times 18$$

$$2 \times 9$$

$$3 \times 6$$

$$2. \quad \underline{x^2 - 5x + 6} \quad (\text{Simple Trinomial})$$
$$(\underline{x - 2})(\underline{x - 3})$$



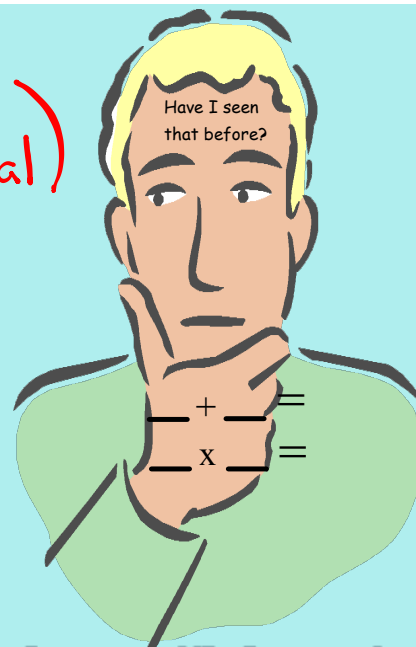
$$\underline{-2} + \underline{-3} = -5$$

$$\underline{-2}x \underline{-3} = 6$$

$$\begin{array}{r} 6 \\ -1x - 6 \\ -2x - 3 \end{array}$$

$$3. \quad x^2 + \underline{5}x - \underline{24} \quad (\text{Simple Trinomial})$$

$$(x - 3)(x + 8)$$



$$\underline{-3} + \underline{8} = 5 \quad \text{And that adds to give you the coefficient of } x$$

$$\underline{-3} \times \underline{8} = -24 \quad \text{Find two numbers that multiply to give you the new number!}$$

-24

$$-1 \quad x + 24$$

$$-2 \quad x + 12$$

$$\underline{-3 \quad x + 8}$$

$$-4 \quad x + 6$$

$$4. \quad 3x^2 - 18x - 120$$

common factor of 3

$$3(\underbrace{1x^2 - 6x - 40}_{\text{simple trinomial}})$$

$$3(x + 4)(x - 10)$$



$$\underline{4} + \underline{-10} = -6$$

$$\underline{4}x - \underline{10} = -40$$

$$-40$$

$$1x - 40$$

$$2x - 20$$

$$\textcircled{4x - 10}$$

$$5x - 8$$

Questions from Homework

$$\textcircled{1} \quad x^2 - \underline{3}x - \underline{54}$$

$$(x+6)(x-9)$$

$$\underline{6} + \underline{-9} = -3$$

$$\underline{6}x - \underline{9} = -54$$

$$-54$$

$$1x - 54$$

$$2x - 27$$

$$3x - 18$$

$$\underline{6x - 9}$$

$$\textcircled{2} \quad n^2 - \underline{1}n - \underline{12}$$

$$(n+3)(n-4)$$

$$\underline{3} + \underline{-4} = -1$$

$$\underline{3}x - \underline{4} = -12$$

$$-12$$

$$1x + 12$$

$$2x - 6$$

$$\underline{3x - 4}$$

$$\textcircled{3} \quad b^2 + \underline{18}b + \underline{81}$$

$$(b+9)(b+9)$$

$$\underline{9} + \underline{9} = 18$$

$$\underline{9}x + \underline{9} = 81$$

$$81$$

$$1x + 81$$

$$3x + 27$$

$$\underline{9x + 9}$$

$$\textcircled{4} \quad x^2 - \underline{4}x + \underline{3}$$

$$(x-1)(x-3)$$

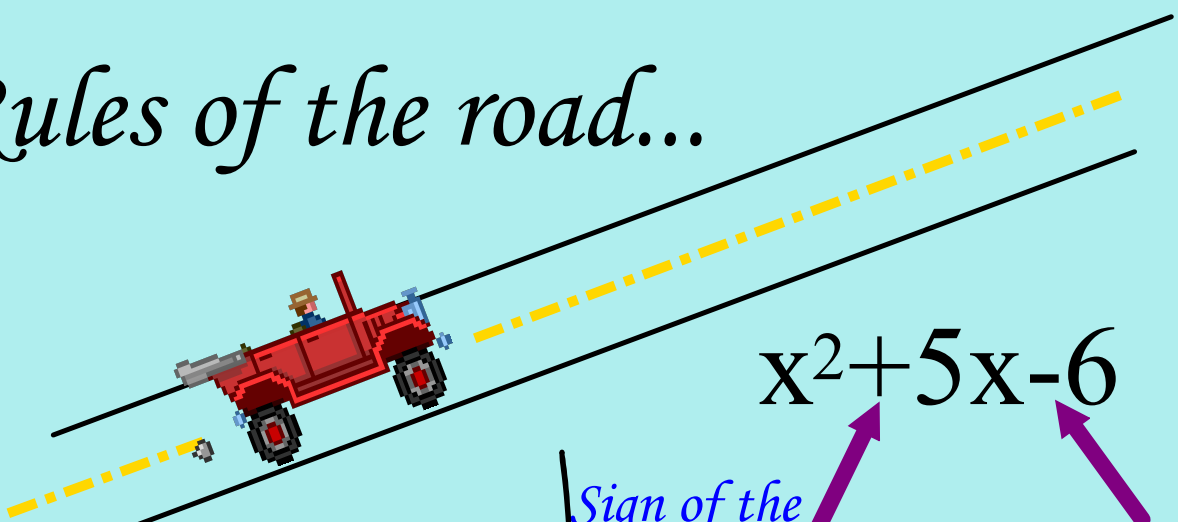
$$\underline{-1} + \underline{-3} = -4$$

$$\underline{-1}x - \underline{3} = 3$$

$$3$$

$$\underline{-1x - 3}$$

Rules of the road...



$$x^2 - 5x + 6$$

Sign of the biggest number.

Signs are the same.

(both "+" or both "-")

$$x^2 - 5x + 6$$

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

$$-2 + -3 = -5$$

$$-2 \times -3 = 6$$

$$0$$

$$-1 \times 6$$

$$-2 \times -3$$

$$x^2 + 5x - 6$$

Sign of the biggest number.

Signs are different.

(one positive, one negative)

$$x^2 + 5x - 6$$

$$(x - 1)(x + 6)$$

$$-1 + 6 = 5$$

$$-1 \times 6 = -6$$

$$-6$$

$$-1 \times 6$$

$$-2 \times 3$$



Check out
a few
on
your own.

Hard Trinomial / Decomposition

$$\underline{2x^2} + \underline{7x} + \underline{3}$$

$$(x+1)(x+\frac{6}{2})$$

$$\cdot (2x+1)(x+3)$$



$$\frac{1}{1} + \frac{6}{6} = 7$$

$$\frac{1}{1} \times \frac{6}{6} = 6 \quad (2 \times 3)$$

$$\begin{array}{ccc} & 6 & \\ 1 & \times & 6 \\ 2 & \times & 3 \end{array}$$

Hard Trinomial / Decomposition

$$\underline{5x^2 + 34x - 7}$$

$$(x - 1)(x + \frac{35}{5})$$

$$(5x - 1)(x + 7)$$



$$\begin{aligned} -1 + 35 &= 34 \\ -1 \times 35 &= -35 \quad (5x-7) \end{aligned}$$

$$\begin{array}{r} -35 \\ -1 \times 35 \\ -5 \times 7 \end{array}$$

Hard Trinomial / Decomposition

$$\underline{\underline{6x^2 - 7x + 2}}$$

$$(x - \frac{3}{6})(x - \frac{4}{6})$$

$$(x - \frac{1}{2})(x - \frac{2}{3}) \text{ Reduce}$$

$$(2x - 1)(3x - 2)$$



$$\begin{aligned} \underline{-3} + \underline{-4} &= -7 \\ \underline{-3} \times \underline{-4} &= 12 \quad (6 \times 2) \end{aligned}$$

$$\begin{aligned} &12 \\ -1 \quad x - 12 \\ -2 \quad x - 6 \\ \underline{-3 \quad x - 4} \end{aligned}$$

Hard Trinomial / Decomposition



$$\underline{8}x^2 + \underline{10}x - \underline{3}$$

$$\left(x - \frac{2}{8}\right) \left(x + \frac{12}{8}\right)$$

$$\left(x - \frac{1}{4}\right) \left(x + \frac{3}{2}\right) \text{ Reduce}$$

$$(4x - 1)(2x + 3)$$



$$\begin{aligned} \underline{-2} + \underline{12} &= 10 \\ \underline{-2} \times \underline{12} &= -24 \quad (8x-3) \end{aligned}$$

$$-24$$

$$-1 \times 24$$

$$-2 \times 12$$


$$-3 \times 8$$

$$-4 \times 6$$

Check out the sheet. :)

DECOMPOSITION

If there is a numerical coefficient in front of x^2 , then we use a method for factoring called *DECOMPOSITION*.


$$4x^2 + 5x - 6$$