

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

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

TRINOMIALS

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

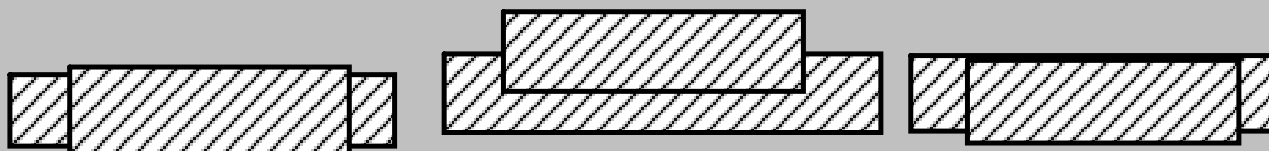
$$m^2 - 8m + 16$$

Expand:

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

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

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



Krow sdrawkcab

Trinomials



$$1. \quad x^2 + \underline{19}x + \underline{18}$$

$$(x+1)(x+18)$$

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

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

18

1x18

2x9

3x6

$$2. \quad x^2 - \underline{5}x + \underline{6}$$

add *multiply*

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



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

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

6

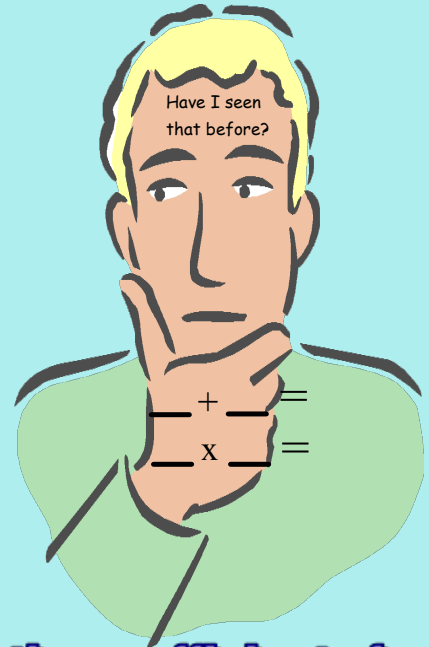
1x6

2x3

Simple trinomial

$$3. \quad x^2 + \underline{5x} - \underline{24}$$

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



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

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

$-24 \rightarrow$ * 1 number must be positive
 1 number must be negative
 1 x 24
 2 x 12
 3 x 8
 4 x 6

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

common factor first

$$\text{GCF} = 3$$

$$3(x^2 - 6x - 40)$$

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



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

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

-40

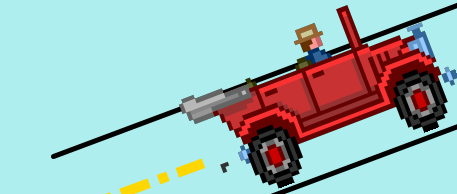
$$1 \times 40$$

$$2 \times 20$$

$$\textcircled{4 \times 10}$$

$$5 \times 8$$

Rules of the road...



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

Sign of the biggest number.

Signs are the same.

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

Sign of the biggest number.

Signs are different.

Factor

(simple trinomials)

Factor

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

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

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

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

$$\begin{array}{c} 6 \\ 1 \times 6 \\ \textcircled{2 \times 3} \end{array}$$

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

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

$$-1 + 6 = 5$$

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

$$\begin{array}{c} 6 \\ \textcircled{1 \times 6} \\ 2 \times 3 \end{array}$$



Check out
a few
on
your own.

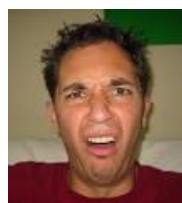
Hard Trinomial GCF=1

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

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

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

Handwritten notes: The trinomial $2x^2 + 7x + 3$ is underlined. A red arrow points from the leading coefficient 2 to the constant term 3. A green arrow points from the constant term 3 to the leading coefficient 2. The factored form $(x + 1)(x + 6)$ is circled in green. A red arrow points from the constant term 3 to the constant term 1 in the first binomial. A green arrow points from the constant term 6 in the second binomial to the constant term 3. The final factored form $(2x + 1)(x + 3)$ is boxed.



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

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

$$\frac{6}{1 \times 6}$$

$$2 \times 3$$

Hard Trinomial

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

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

$$\boxed{(5x - 1)(x + 7)}$$



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

$$\begin{aligned} &-35 \\ &\textcircled{1 \times 35} \\ &5 \times 7 \end{aligned}$$

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

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

Reduce
Fractions

$$\left(x - \frac{1}{2}\right) \left(x - \frac{2}{3}\right)$$

$$\boxed{(2x-1)(3x-2)}$$



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

12

1x12

2x6

3x4

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

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

Reduce
Fractions

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

$$\boxed{(4x-1)(2x+3)}$$



signs are different
larger # is (+)

$$-\frac{2}{8} + \frac{12}{8} = 10$$

$$-\frac{2}{8} \times \frac{12}{8} = -24 \quad (8x-3)$$

24

$$\begin{array}{l} 1 \times 24 \\ 2 \times 12 \\ 3 \times 8 \\ 4 \times 6 \end{array}$$

Check out the sheet. :)

$$\textcircled{5} \quad 5n^2 - 65n + 180$$

$$5(n^2 - \underline{13}n + \underline{36})$$

$$5(x-4)(x-9)$$

$$\underline{-4} + \underline{-9} = -13$$

$$\underline{-4} \times \underline{-9} = 36$$

36

1 x 36

2 x 18

3 x 12

4 x 9

6 x 6

Hard Trinomial

$$\textcircled{7} \quad \underline{9}m^2 - \underline{80}m + \underline{80}$$

$$(m - \underline{10})(m - \underline{70})$$

↑ 9 9

$$\boxed{(9m - 10)(m - 8)}$$

$$-\underline{10} + \underline{-70} = -80$$

$$-\underline{10} \times \underline{-70} = 700 \quad (9 \times 80)$$

700

1 x 700

2 x 360

3 x 240

4 x 180

5 x 144

6 x 120

8 x 90

9 x 80

$$\textcircled{10 \times 70}$$

Questions from Homework (# 14)

Simple Trinomial (a=1)

⑪ $k^2 + 15k + 50$
 $(k + 5)(k + 10)$

$\underline{5} + \underline{10} = 15$
 $\underline{5} \times \underline{10} = 50 \quad (1 \times 50)$

Hard Trinomial (a≠1)

⑬ $6n^2 - 17n - 10$
 $(n + \frac{3}{6})(n - \frac{20}{6})$

$\underline{3} + \underline{-20} = -17$
 $\underline{3} \times \underline{-20} = -60 \quad (6 \times -10)$

Reduce

$(n + \frac{1}{2})(n - \frac{10}{3})$
 $(2n + 1)(3n - 10)$

60
 1x60
 2x30
3x20
 4x15
 5x12
 6x10