

Simple Trinomials

Date _____

Factor each completely.

$$1) n^2 + 11n + 24$$
$$(n+3)(n+8)$$

$$3) x^2 - 6x - 16$$
$$(x-8)(x+2)$$

$$5) n^2 - 12n + 32$$
$$(n-8)(n-4)$$

$$7) r^2 + 7r - 18$$
$$(r+9)(r-2)$$

$$9) x^2 + 4x - 60$$
$$(x+10)(x-6)$$

$$11) n^2 - 2n - 35$$
$$(n-7)(n+5)$$

$$13) n^2 + 6n - 40$$
$$(n+10)(n-4)$$

$$2) v^2 + 8v + 15$$
$$(v+5)(v+3)$$

$$4) x^2 + 3x - 54$$
$$(x+9)(x-6)$$

$$6) k^2 + 10k + 16$$
$$(k+8)(k+2)$$

$$8) n^2 + 3n - 18$$
$$(n+6)(n-3)$$

$$10) p^2 + 5p - 14$$
$$(p+7)(p-2)$$

$$12) x^2 + 10x + 24$$
$$(x+6)(x+4)$$

$$14) x^2 + 8x + 7$$
$$(x+7)(x+1)$$

Warm Up



Factor each of the following:

1. $10x^2y^5 + 20x^7y^3 - 25x^4y^9$

$$5x^2y^3(2y^2 + 4x^5 - 5x^2y^6)$$

2. $m^2 + 13m - 30$

$$(m-2)(m+15)$$

3. $x^2 - 10x + 24$

$$(x-6)(x-4)$$

4. $3x^2 + 3x - 36$

$$3(x^2 - x - 12)$$

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

II. Factoring Trinomials:

Type 2: Polynomials of the form $ax^2 + bx + c$

- Most efficient technique to factor most trinomials of this form is a process known as "DECOMPOSITION".

ex.

$$\underline{5}x^2 - 6x - 8 \quad \xrightarrow{-40}$$

(Hard Trinomials)

$$\underline{5x^2 - 10x} + \underline{4x - 8}$$

$$5x(\underline{x-2}) + 4(\underline{x-2})$$

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

$$\begin{array}{l} -10 \times 4 = -40 \\ -10 + 4 = -6 \end{array}$$

Hard Trinomials

- has three terms with the form...

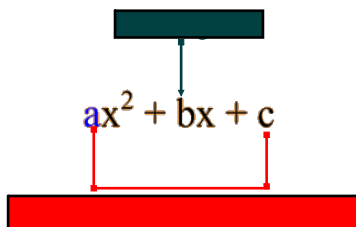
$$ax^2 + bx + c$$

- a hard trinomial has an "a" value not equal to 1.

- we use a method of decomposition to factor them.

DECOMPOSITION METHOD

- here's how it goes... "What two numbers?"



- once you find the two numbers, use them to break the MIDDLE TERM into two pieces (decomposition).

- then, factor by grouping.

- check it out...

EXAMPLES:

$$1) \quad 2x^2 + 5x - 12 \quad -24$$

$$\underline{2x^2 + 8x} - 3x - 12$$

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

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

$$2) \quad 5x^2 - 13x - 6 \quad -30$$

$$\underline{5x^2 - 15x} + 2x - 6$$

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

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

$$3) \quad 9x^2 - 12x + 4 \quad +36$$

$$9x^2 - 6x - 6x + 4$$

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

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

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

$$4) \quad 18x^2 - 33x + 9 \quad +8$$

$$3(6x^2 - 11x + 3)$$

$$3(6x^2 - 9x - 2x + 3)$$

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

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

$$18x^2 - 27x - 6x + 9$$

$$9x(2x-3) - 3(2x-3)$$

$$(2x-3)(9x-3)$$

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

$$2x^2 + 5x - 12 \quad (-24)$$

$$\left(\frac{2x}{2} + \frac{8}{2}\right)(2x - 3)$$

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

$$5x^2 - 13x - 6 \quad (-30)$$

$$\left(\frac{5x}{5} - \frac{15}{5}\right)(5x + 2)$$

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

$$18x^2 - 33x + 9$$

$$3(6x^2 - 11x + 3)$$

$$3\left(\frac{6x}{3} - \frac{9}{3}\right)\left(\frac{6x}{2} - \frac{2}{2}\right)$$

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

$$18x^2 - 33x + 9$$

$$\left(\frac{18x}{9} - \frac{27}{9}\right)\left(\frac{18x}{6} - \frac{6}{6}\right)$$

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

Problem!!!
Where did common factor go???

Let's try a few...

Completely factor each of the following:

$$5a^2 - a + 4$$

$$8a^2 - 10a - 3$$

$$9 + 3x - 2x^2$$

$$2y^2 - 12y + 10$$