

Let's try and factor each of the following trinomials:

$$\begin{array}{l}
 x^2 + 12x + 32 \\
 (x + 8)(x + 4) \quad \begin{array}{l} -x - = 32 \\ - + - = 12 \end{array}
 \end{array}
 \qquad
 \begin{array}{l}
 a^2 + 10a - 24 \\
 (a + 12)(a - 2)
 \end{array}$$

$$\begin{array}{l}
 w^2 - 13w - 30 \\
 (w + 2)(w - 15)
 \end{array}$$

$$\begin{array}{l}
 x^2 - 8x + 12 \\
 (x - 6)(x - 2)
 \end{array}$$

$$\textcircled{12} \quad 6a^4b - 10a^3b^2 - 6a^2b^3$$

$$2a^2b(3a^2 - 5ab - 3b^2) \quad \textcircled{\text{GCF}}$$

PRACTICE QUESTIONS...

* Ignore algebra tiles part of the question

p. 155: #7 (GCF) p. 166: #9 (expanding)

#8 (GCF) #11 (simple trinomial)

#9 (GCF)

#16 (GCF)

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 By Grouping - sometimes there is no GCF amongst all of the terms in the polynomial.

- as a result, "pairing" certain terms together and removing a common factor may lead to the polynomial being factorable.

- usually done when polynomial has **FOUR** terms.

EXAMPLES...

1) $10x^2 - 5xy - 6x + 3y$

2) $3mx - n + m - 3nx$



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

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

$$5x \text{ (smiley)} - 3 \text{ (smiley)}$$

$$\text{(smiley)}(5x - 3)$$

$$\frac{3mx - 3nx}{3x} - \frac{n + m}{1}$$

$$3x \left(\frac{m-n}{m-n} \right) + \frac{(m-n)}{\frac{m-n}{m-n}}$$

$$(m-n)(3x+1)$$

$$3mx + m - 3nx - n$$

$$m(3x+1) - n(3x+1)$$

$$(3x+1)(m-n)$$

$$\underline{3x^2 + 6x + 4x + 8}$$

$$\textcircled{3x}(\underline{x+2}) + \textcircled{4}(\underline{x+2})$$

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

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

$$\textcircled{2x}(\underline{2x-5}) + \textcircled{1}(\underline{2x-5})$$

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

Example 3

Factoring a Trinomial Written in Ascending Order

Factor: $-24 - 5d + d^2$

$$d^2 - 5d - 24$$
$$(d - 8)(d + 3)$$

3.5 Polynomials of the Form $x^2 + bx + c$

Factor each completely.

1) $n^2 + 11n + 24$

2) $v^2 + 8v + 15$

3) $x^2 - 6x - 16$

4) $x^2 + 3x - 54$

5) $n^2 - 12n + 32$

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

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

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

9) $x^2 + 4x - 60$

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

11) $n^2 - 2n - 35$

12) $x^2 + 10x + 24$

13) $n^2 + 6n - 40$

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