

FACTURING
POLYNOMIALS

example 1:
Factor $2x + 42y$

example 2:
Factor $4x^4 + 24x^3$

example 24:
Factor $x^3 + 2x^2 + 8x + 16$

example 25:
Factor $x^3 - 10 - 5x + 2x^2$

summary: _____

four terms

example 20:

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

example 21:

Factor $-9m(m + 3) - 5(m + 3)$

example 22:

Factor $3y^2(y - 2) + 4(2 - y)$

example 23:

Factor $2d(d - 5) - 3(5 - d)$

example 3:

Factor $8a^2b - 6ab^2$

example 4:

Factor $20x^2y^2 - 4xy$

summary: _____

greatest common factor

example 5:

Factor $x^2 + 11x + 18$

example 6:

Factor $m^2 + 9m + 14$

algebra	examples
$a^2 + 2ab + b^2 =$	example 16: Factor $x^2 + 6x + 9$ example 17: Factor $4g^2 + 4gh + h^2$
$a^2 - 2ab + b^2 =$	example 18: Factor $x^2 - 10x + 25$ example 19: Factor $n^2 - 12n + 36$

summary: _____

“special” products $(a^2 - b^2)$ & $(a^2 \pm 2ab + b^2)$

algebra

examples:

$$a^2 - b^2 =$$

example 13:
Factor $9x^2 - 16$

example 14:
Factor $25n^2 - 81$

example 15:
Factor $8 - 18g^2$

example 7:
Factor $y^2 - 6y + 8$

example 8:
Factor $w^2 + 2w - 15$

summary: _____

trinomial factoring $(x^2 + bx + c)$

example 9:

Factor $3y^2 + 4y - 15$

example 10:

Factor $2x^2 - 7x + 3$

example 11:

Factor $-5m^2 + 6m - 1$

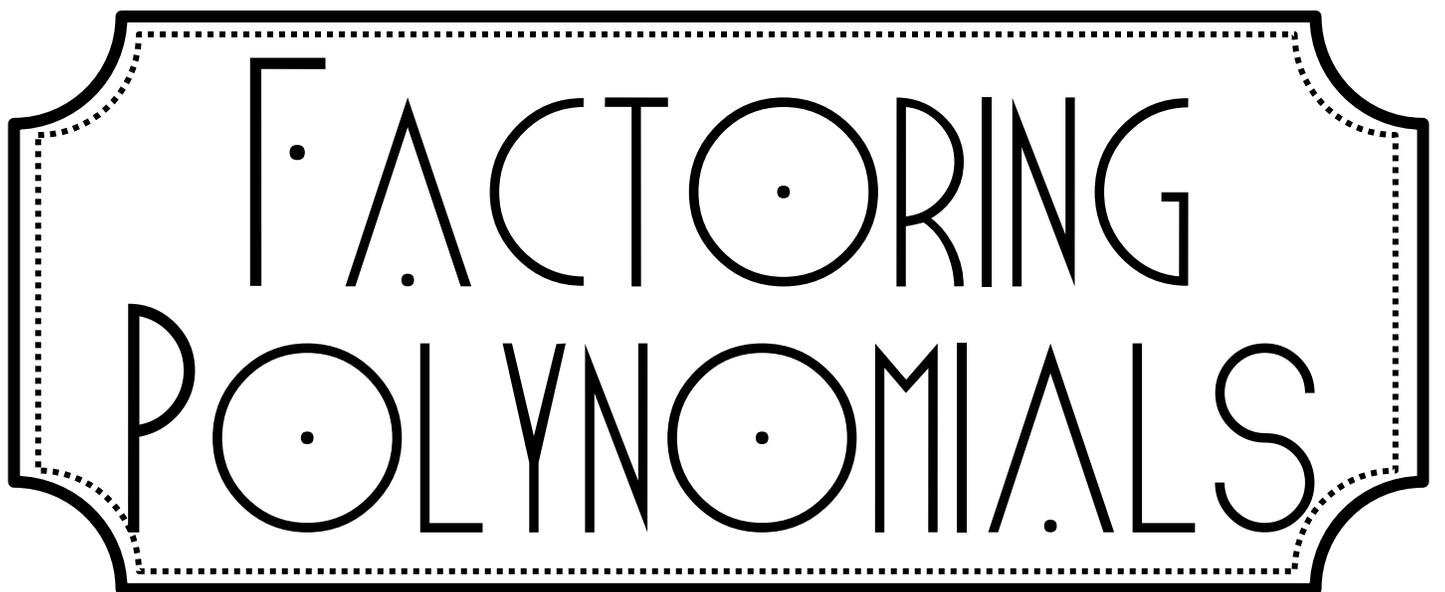
example 12:

Factor $-3k^2 - k + 2$

summary: _____

trinomial factoring

$(ax^2 + bx + c)$



FACTORING
POLYNOMIALS

example 1:

$$\text{Factor } \frac{2x}{2} + \frac{42y}{2}$$

$$2(x + 21y)$$

example 2:

$$\text{Factor } \frac{4x^4}{4x^3} + \frac{24x^3}{4x^3}$$

$$4x^3(x + 6)$$

example 24:

$$\text{Factor } x^3 + 2x^2 + 8x + 16$$

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

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

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

example 25:

$$\text{Factor } x^3 - 10 - 5x + 2x^2$$

$$x^3 + 2x^2 - 5x - 10$$

$$(x^3 + 2x^2) + (-5x - 10)$$

$$x^2(x + 2) - 5(x + 2) = (x + 2)(x^2 - 5)$$

*Use the commutative property to rewrite the polynomial so that you can group terms with a common factor!

summary: _____

four terms

example 20:

$$\text{Factor } \frac{5x(x-2)}{(x-2)} + \frac{7(x-2)}{(x-2)}$$

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

* Factor out the common binomial

example 21:

$$\text{Factor } \frac{-9m(m+3)}{(m+3)} - \frac{5(m+3)}{(m+3)}$$

$$(m+3)(-9m-5)$$

example 22:

$$\text{Factor } 3y^2(y-2) + 4(2-y)$$

$$\frac{3y^2(y-2)}{(y-2)} - \frac{4(y-2)}{(y-2)}$$

$$(y-2)(3y^2-4)$$

example 23:

$$\text{Factor } 2d(d-5) - 3(5-d)$$

$$\frac{2d(d-5)}{(d-5)} + \frac{3(d-5)}{(d-5)}$$

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

example 3:

$$\text{Factor } \frac{8a^2b}{2ab} - \frac{6ab^2}{2ab}$$

$$2ab(4a-3b)$$

example 4:

$$\text{Factor } \frac{20x^2y^2}{4xy} - \frac{4xy}{4xy}$$

$$4xy(5xy-1)$$

summary: _____

greatest common factor

example 5:

Factor $x^2 + 11x + 18$

$$(x + 2)(x + 9)$$

Multiply to	Add to
18	11
1 x 18	19
2 x 9	11
3 x 6	18

example 6:

Factor $m^2 + 9m + 14$

$$(m + 2)(m + 7)$$

Multiply to	Add to
14	9
1 x 14	15
2 x 7	9

algebra

$$a^2 + 2ab + b^2 = (a + b)^2$$

$$a^2 - 2ab + b^2 = (a - b)^2$$

examples

example 16: Factor $x^2 + 6x + 9$

$$(x + 3)^2$$

example 17: Factor $4g^2 + 4gh + h^2$

$$(2g + h)^2$$

example 18: Factor $x^2 - 10x + 25$

$$(x - 5)^2$$

example 19: Factor $n^2 - 12n + 36$

$$(n - 6)^2$$

summary: _____

“special” products $(a^2 - b^2)$ & $(a^2 \pm 2ab + b^2)$

algebra

examples:

$$a^2 - b^2 = (a + b)(a - b)$$

example 13:

Factor $9x^2 - 16$

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

example 14:

Factor $25n^2 - 81$

$$(5n + 9)(5n - 9)$$

example 15:

Factor $8 - 18g^2$

$$2(4 - 9g^2) = 2(2 + 3g)(2 - 3g)$$

*Don't forget to factor out the GCF first, if there is one!



example 7:

Factor $y^2 - 6y + 8$

$$(y - 2)(y - 4)$$

Multiply to	Add to
8	-6
1 x 8	9
2 x 4	8
-1 x -8	-9
-2 x -4	-6

example 8:

Factor $w^2 + 2w - 15$

$$(w - 3)(w + 5)$$

Multiply to	Add to
-15	2
1 x -15	-14
-1 x 15	14
3 x -5	-2
-3 x 5	2

summary: _____

trinomial factoring

$$(x^2 + bx + c)$$

example 9:

Factor $3y^2 + 4y - 15$

$$\begin{aligned}
 &3y^2 + 9y - 5y - 15 \\
 &(3y^2 + 9y) + (-5y - 15) \\
 &3y(y + 3) - 5(y + 3)
 \end{aligned}$$

$$(y + 3)(3y - 5)$$

Multiply to	Add to
-45	4
9 x -5	4

example 10:

Factor $2x^2 - 7x + 3$

$$\begin{aligned}
 &2x^2 - 1x - 6x + 3 \\
 &(2x^2 - 1x) + (-6x + 3) \\
 &x(2x - 1) - 3(2x - 1)
 \end{aligned}$$

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

Multiply to	Add to
6	-7
-1 x -6	-7

example 11:

Factor $-5m^2 + 6m - 1$

$$\begin{aligned}
 &-1(5m^2 - 6m + 1) \\
 &-1(5m^2 - 5m - 1m + 1) \\
 &-1[(5m^2 - 5m) + (-1m + 1)] \\
 &-1[5m(m - 1) - 1(m - 1)]
 \end{aligned}$$

$$-1(m - 1)(5m - 1)$$

Multiply to	Add to
5	-6
-1 x -5	-6

example 12:

Factor $-3k^2 - k + 2$

$$\begin{aligned}
 &-1(3k^2 + k - 2) \\
 &-1[3k^2 + 3k - 2k - 2] \\
 &-1[(3k^2 + 3k) + (-2k - 2)] \\
 &-1[3k(k + 1) - 2(k + 1)]
 \end{aligned}$$

$$-1(k + 1)(3k - 2)$$

Multiply to	Add to
-6	1
3 x -2	1

summary: _____

trinomial factoring

$(ax^2 + bx + c)$

<http://www.teacherspayteachers.com/Store/Lisa-Davenport>

directions:

Step 1: Print the following pages front to back 1&2, 3&4, 5&6 so that the writing faces in opposite directions. I print front to back using the option " flip along the short side".

Step 2: Line up the 3 pages as shown below.



Step 3: Fold over the top portion of all three pages and secure with a few staples at the top.

The final product should look like this:

