

Algebra 12-5 Factoring $ax^2 + bx + c$

Warm-Up

Solve by factoring.

$$1. \overset{F}{x^2} + 10x - 24 = 0 \quad \overset{L}{-2, 12}$$

$$(x-2)(x+12) = 0$$

$$\begin{array}{l} x-2=0 \\ \boxed{x=2} \end{array} \quad \begin{array}{l} x+12=0 \\ \boxed{x=-12} \end{array}$$

$$2. \overset{F}{t^2} + 9t + 18 = 0 \quad \overset{L}{3, 6}$$

$$(t+3)(t+6) = 0$$

$$\begin{array}{l} t+3=0 \\ -3-3 \\ \hline \boxed{t=-3} \end{array}$$

$$\begin{array}{l} t+6=0 \\ -6-6 \\ \hline \boxed{t=-6} \end{array}$$

Algebra 12-5 Factoring $ax^2 + bx + c$

F O I L $\rightarrow 1, 3$
 Factor $2x^2 + 5x + 3$.

~~$(2x - 1)(x + 3)$
 $+ 6x$~~
 $(2x + 3)(x + 1)$
 $+ 3x$
 $+ 2x$

1. Multiply "a value and c value"
2. Factor.
3. _____ by the number you multiplied by in step _____.
4. _____.
5. Place numbers in the _____ in front of the variable.
6. Check by _____ or _____.

Examples

1. $2n^2 - 3n - 20$

F O I L $\begin{matrix} 1, 20 \\ 2, 10 \\ 4, 5 \end{matrix}$

$$\begin{array}{r} (2n + 5)(n - 4) \\ \hline 2n^2 + 5n - 4n - 20 \\ \hline 2n^2 + n - 20 \end{array}$$

$10n$

2. $6y^2 - 29y - 5 = 0$

Solve $\begin{matrix} 1, 6 \\ 2, 3 \end{matrix}$ $\begin{matrix} 1, 5 \\ 5, 1 \end{matrix}$

$$(2y + 1)(3y - 5) = 0$$

$$(2y - 5)(3y + 1) = 0$$

$$(6y + 1)(y - 5) = 0$$

Assignment: 12-5 #'s 1 a-d, 2-8, 12-16, 20, 22

$$\begin{array}{r} 6y + 1 = 0 \\ \hline 6y = -1 \\ \hline 6 \quad 6 \end{array}$$

$$y = -\frac{1}{6}$$

$$y - 5 = 0$$

$$y = 5$$

1. a)

b)

c)

d)

2. a)

b)

3.

$$4. \overset{F}{2}x^{\overset{01}{2}} + 7x + \overset{L}{5}$$

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

Diagram showing the expansion of $(2x + 5)(x + 1)$ with a blue bracket under the terms $+5x$ and $+2x$.

$$5. \overset{F}{7}x^{\overset{01}{2}} - 36x + \overset{L}{5}$$

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

Diagram showing the expansion of $(7x - 1)(x - 5)$ with a red bracket under the terms $-1x$ and $-35x$.

$$6. \quad y^2 + 10y + 9$$

$$(y + 1)(y + 9)$$

1,4
2,2

$$7. \quad 4x^2 - 12x - 7$$

$$(2x + 1)(2x - 7)$$

+2x
-14x