

Friday, January 11, 2019

- Warm-up

- Factor the following trinomials:

$$x^2 + 2x + 1$$

Handwritten annotations: The terms $2x$ and 1 are circled in red. A blue arrow points from the coefficient 2 to a red circle containing $1, 1$. A red arrow points from the constant term 1 to a red circle containing $-1, -1$.

$$(x + 1)(x + 1)$$
$$(x + 1)^2$$

$$x^2 - 0x - 1$$

Handwritten annotations: The entire trinomial is enclosed in a green box. The terms $-0x$ and -1 are circled in red. A green arrow points from the x^2 term to $x^2 - 1$ written above. A red arrow points from the -1 term to a red circle containing $+1, -1$. A blue arrow points from the coefficient 0 to the same red circle.

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

- Using the factors to solve...

Objectives:

Content: I will factor trinomials with an a value of 1 and use those factors to solve for x.

Social: I will demonstrate my work to the group as well as the class.

Language: I will write my factoring and solving process clearly for myself and others.

How can I multiply to get zero?

$$\boxed{0} \times \square = 0$$

at least one has to
be zero

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So ... if $a * b = 0$, what must be true?

$$a = 0 \quad \text{and/or} \quad b = 0$$

Zero product
property

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$$a \cdot b$$

$$\text{So ... if } \underbrace{(x + 3)} \underbrace{(x - 6)} = 0?$$

$$\begin{array}{r} x + 3 = 0 \\ -3 \quad -3 \end{array}$$

$$x = -3$$

$$\begin{array}{r} x - 6 = 0 \\ +6 \quad +6 \end{array}$$

$$x = 6$$

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Try a couple

$$(x + 4)(x - 2) = 0$$

$$x = -4 \text{ or } x = 2$$

$$\begin{array}{r} x + 4 = 0 \\ -4 \quad -4 \\ \hline x = -4 \end{array}$$

$$\begin{array}{r} x - 2 = 0 \\ +2 \quad +2 \\ \hline x = 2 \end{array}$$

$$(x - 5)(x + 3) = 0$$

$$x - 5 = 0 \quad x + 3 = 0$$
$$x = 5 \quad x = -3$$

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But, they don't all begin factored

$$x^2 + 3x - 10 = 0$$

Handwritten notes: $1, -10$
 $2, -5$
 $5, -2$
 $10, -1$

$$(x+5)(x-2) = 0$$
$$x+5=0 \quad x-2=0$$
$$x=-5 \quad x=2$$

$$x^2 - 10x + 25 = 0$$
$$(x-5)(x-5) = 0$$
$$x-5=0 \quad x-5=0$$
$$x=5$$

$$m^2 + 5m - 84 = 0$$
$$(m+12)(m-7) = 0$$
$$m+12=0 \quad m-7=0$$
$$m=-12 \quad m=7$$

$$y^2 + 9y + 20 = 0$$
$$(y+5)(y+4) = 0$$
$$y+5=0 \quad y+4=0$$
$$y=-5 \quad y=-4$$

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What if a term is missing?

$$x^2 - 25 = 0$$

$$x^2 + 0x - 25 = 0$$

$$(x-5)(x+5) = 0$$

$$\begin{aligned} x-5 &= 0 & x+5 &= 0 \\ x &= 5 & x &= -5 \end{aligned}$$

$$\begin{array}{l} x^2 - 25 = 0 \\ +25 \quad +25 \\ \hline \sqrt{x^2} = \sqrt{25} \end{array}$$

$$x = 5 \text{ or } -5$$

$$x^2 + 3x = 0$$

$$x^2 + 3x + 0 = 0$$

$$(x+0)(x+3) = 0$$

$$x+0 = 0 \quad x+3 = 0$$

$$x = 0 \quad x = -3$$

$$x(x+3) = 0$$

$$x = 0 \quad x+3 = 0$$

$$x = -3$$

Total of 4 required
More Practice


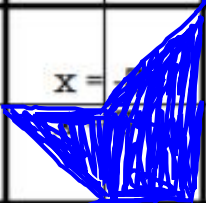
$$x^2 - 9 = 0$$

$$+9 \quad +9$$
















$$\sqrt{x^2} = \sqrt{9}$$

$x = 3$ or $x = -3$

all =
bonus

| | | | |
|-----------------------|---|--|----------------------|
| $x = -13$ $x = -1$ | $x = -2$ $x = 5$ |  | $x = -4$ $x = 4$ |
| $x = 3$ $x = 4$ | $x = 2$ $x = 11$ | $x = -4$ $x = 3$ | $x = -4$ $x = 1$ |
| $x = 3$ $x = 6$ | $x = -6$ $x = -1$ | $x = -5$ $x = 5$ | $x = -5$ $x = -4$ |
| $x = -3$ $x = -2$ | $x = -1$  | $x = -5$ $x = 2$ | $x = 4$ $x = 6$ |

Solve each quadratic equation and then find the answers in the boxes above.
Color the boxes according to the given pattern.

| | | | | | |
|---------------------|---|----------------------|---|----------------------|---|
| $x^2 + 5x + 6 = 0$ |  | $x^2 + 3x - 4 = 0$ |  | $x^2 - 3x - 10 = 0$ |  |
| $x^2 - 7x + 12 = 0$ |  | $x^2 - 25 = 0$ |  | $x^2 - 10x + 24 = 0$ |  |
| $x^2 + 7x + 6 = 0$ |  | $x^2 + x - 12 = 0$ |  | $x^2 - 16 = 0$ |  |
| $x^2 + 3x - 10 = 0$ |  | $x^2 - 9x + 18 = 0$ |  | $x^2 + 9x + 20 = 0$ |  |
| $x^2 - 9 = 0$ ✓ |  | $x^2 - 13x + 22 = 0$ |  | $x^2 + 14x + 13 = 0$ |  |