

Do Now:

Which of the following can be solved by factoring?

$$x^2 + 4x + 1 = 0 \quad \begin{matrix} p=1, 1 \\ s=4 \end{matrix}$$

* Cannot Foil

$$x^2 + 4x + 4 = 0 \quad \begin{matrix} p=4 \\ s=4 \end{matrix}$$

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

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8.3 Mixed Solving

What is a Quadratic Equation: An equation with a degree of 2.
Equal to zero.

Standard form of quadratic equation: $ax^2 + bx + c = 0$

- descending order
- equal to zero.
- a cannot be negative

Ways to solve a quadratic equation:

Factoring $\rightarrow$ Standar Form

- * = 0
- * Use factoring

Completing the square
Form $\rightarrow x^2 + bx = c$
* Our leading coefficient must be one.
* $\left(\frac{b}{2}\right)^2 \rightarrow$ Add to both sides
* $(x \pm \frac{b}{2})^2$
* $\pm \sqrt{\quad}$

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Solve by Factoring:

1. $a^2 + 8a + 19 = 7$
 $a^2 + 8a + 19 - 7 = 0$
 $a^2 + 8a + 12 = 0$
 $(a+2)(a+6) = 0$
 $a+2=0$ or $a+6=0$
 $a = -2$ or $a = -6$

Solve by Completing the Square: $x^2 + bx = c$

2. $x^2 + 4x + 1 = 0$

$$x^2 + 4x = -1$$

$$x^2 + 4x + 4 = -1 + 4$$

$$(x+2)^2 = 3$$

$$x+2 = \pm\sqrt{3}$$

$$x = -2 \pm \sqrt{3}$$

$$x = -2 - \sqrt{3} \text{ or } x = -2 + \sqrt{3}$$

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Solve by Completing the Square:

3.

$$x^2 = 12x + 4$$

$$x^2 - 12x = 4$$

$$x^2 - 12x + 36 = 4 + 36$$

$$x^2 - 12x + 36 = 40$$

$$(x-6)^2 = 40$$

$$x-6 = \pm\sqrt{40}$$

$$x = 6 \pm \sqrt{40}$$

$$x = 6 \pm \sqrt{4 \cdot 10}$$

$$x = 6 \pm \sqrt{4} \sqrt{10}$$

$$x = 6 \pm 2\sqrt{10}$$

$$x = 6 + 2\sqrt{10}$$

or

$$x = 6 - 2\sqrt{10}$$

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Solve by Completing the Square: $x^2 + bx = c$

4.

$$2x^2 - 16x - 84 = -2$$

$$\begin{matrix} \text{divided by 2} \end{matrix} \quad \begin{matrix} 2x^2 - 16x = -2 + 84 \\ 2x^2 - 16x = 82 \end{matrix}$$

$$x^2 - 8x = 41$$

$$x^2 - 8x + 16 = 41 + 16$$

$$x^2 - 8x + 16 = 57$$

$$(x-4)^2 = 57$$

$$x-4 = \pm\sqrt{57}$$

$$x = 4 \pm \sqrt{57}$$

$$x = 4 - \sqrt{57} \text{ or } x = 4 + \sqrt{57}$$

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Word Problems:

* Use one variable

* Solve by factoring

* let x =

* Check if answers need to be rejected

$\hookrightarrow$ if so $\rightarrow$ State why.

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