

4-5 Completing the Square

I can... complete the square and find the roots/solutions/zeros for a quadratic.

Day 2: completing the square to solve!

$$\sqrt{(x+2)^2} = 9$$

$$x^2 + 4x + 4 = 9$$

Solve By Completing the Square

Standard Form

$$ax^2 + bx + c$$

1. Variable on one side
Constants on the other.
You want the $ax^2 + bx$ on one side and the $+c$ on the other.

2. Divide to make a $=+ 1$.

3. Find the number you need to complete the square!

$$c = \left(\frac{b}{2}\right)^2$$

4. Add the result to BOTH SIDES

We must always do the same thing on both sides when solving equations.

5. Factor - write it as a binomial squared

6. Solve using square root method.

$$x^2 + 6x + 8 = 0$$

$$x^2 + 6x + 9 = -8 + 9$$

$$\sqrt{(x+3)^2} = \sqrt{1}$$

$$x+3 = \pm 1$$

$$x = -2 \quad x = -4$$

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A
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C

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Packet Pg2 #1

1. Variable on one side
Constants on the other.

2. Divide to make a $=+ 1$.

3. Find the number you need to complete the square!

$$c = \left(\frac{b}{2}\right)^2$$

4. Add the result to BOTH SIDES

We must always do the same thing on both sides when solving equations.

5. Factor - write it as a binomial squared

6. Solve using square root method.

$$x^2 + 6x = 0$$

$$x^2 + 6x + 9 = +9$$

$$\sqrt{(x+3)^2} = \sqrt{9}$$

$$x+3 = \pm 3$$

$$x = 0$$

$$x = -6$$

You Try: $x^2 - 30x = 0$

Solving by Completing the Square

Packet Pg2 #2

$$x^2 + 4x = 6$$

$$\underbrace{x^2 + 4x + 4}_{(x+2)^2} = 6 + 4$$

$$\sqrt{(x+2)^2} = \sqrt{10}$$

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

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

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

Solving by Completing the Square

Packet Pg3 #4

$$2x^2 + 7x - 4 = 0$$

$$\frac{2x^2}{2} + \frac{7x}{2} = \frac{4}{2}$$

$$x^2 + \frac{7}{2}x + \frac{49}{16} = 2 + \frac{49}{16}$$

$$C = \left(\frac{b}{a}\right)^2$$

$$\left(\frac{7}{4}\right)^2 = \frac{49}{16}$$

$$\sqrt{\left(x + \frac{7}{4}\right)^2} = \sqrt{\frac{81}{16}}$$

$$x + \frac{7}{4} = \pm \frac{9}{4} - \frac{7}{4}$$

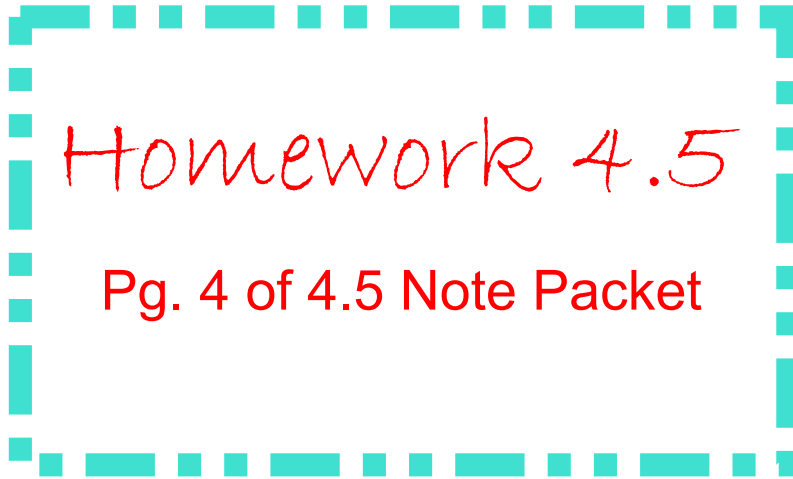
$$x = \frac{9}{4} - \frac{7}{4} = \frac{2}{4} = \frac{1}{2}$$

$$x = \frac{-9}{4} - \frac{7}{4} = \frac{-16}{4} = -4$$

You Try

Packet Pg3 #3

$$2x^2 + 8x - 18 = 0$$



Homework 4.5

Pg. 4 of 4.5 Note Packet