

Lesson 19

Aim: How do we solve quadratic equations by the completing the square method?

HW: Ch. 5 Read pages 186 to 192
page 192 #4,8,19,22,30 Ch 3 page 112 # 17

Do Now:

Factor:

$$1. x^2 - 4x + 4 \quad (x - 2)(x - 2) \text{ or } (x-2)^2$$

Solve for x:

$$2. x^2 - 6x - 7 \quad (x-7)(x+1) = 0$$

$$x-7=0 \quad x+1=0$$

$$x=7 \quad x=-1$$

$$3. x^2 - 6x + 7 \quad \text{CAN NOT BE FACTORED}$$

- *What do we do????*

Oct 12-9:12 AM

For Completing the Square

move the constant term

to the other side.

add the square of half of

the middle term (coefficient of b).

add this to both sides.

Factor to find the

perfect square.

take the square root

on both sides.

Solve for x.

$$x^2 - 6x + 7 = 0$$

$$x^2 - 6x = -7$$

$$x^2 - 6x = -7$$

(Divide 6 by 2 to help get the perfect square)

$$x^2 - 6x + 3^2 = -7 + 3^2$$

$$x^2 - 6x + 9 = -7 + 9$$

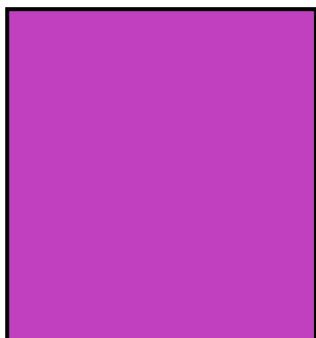
$$x^2 - 6x + 9 = 2$$

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

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

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

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



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

• Move the constant. $x^2 + 6x + \underline{\quad} = -2 + \underline{\quad}$

• Form a "perfect square". $x^2 + 6x + 9 = -2 + 9$

• Factor & Simplify. $(x + 3)^2 = 7$

• Square root. $\sqrt{(x + 3)^2} = \sqrt{7}$
 $x + 3 = \pm \sqrt{7}$

• Solve what is left. $x = -3 \pm \sqrt{7}$

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Solve: $2x^2 + 8x - 3 = 0$

Solve for x: $\frac{2x^2 + 8x - 3}{2} = 0$ Each term divided by the leading coefficient

$$x^2 + 4x - \frac{3}{2} = 0$$

$$+ \frac{3}{2} + \frac{3}{2}$$

Move the constant to the right side.

$$x^2 + 4x = \frac{3}{2}$$

$$x^2 + 4x + 4 = \frac{3}{2} + 4$$

Add the square of the middle term on both sides

$$(x + 2)^2 = \frac{11}{2}$$

Factor left side and simplify right side

$$x + 2 = \pm \sqrt{\frac{11}{2}}$$

Take square root on both sides

$$x = -2 \pm \sqrt{\frac{11}{2}}$$

solve for x

Oct 12-9:26 AM

Solve for x by completing square

$$1. x^2 + 6x + 3 = 0 \quad -3 \pm \sqrt{6}$$

$$2. x^2 - 4x - 6 = 0 \quad 2 \pm \sqrt{10}$$

$$3. x^2 + 10x + 17 = 0 \quad -5 \pm 2\sqrt{2}$$

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Oct 12-9:41 AM