

Steps for Completing the Square	1)	Move the constant term to the other side of the equal sign.
	2)	Divide both sides by the number in front of the x^2 (if needed).
	3)	Take the middle term and do the following: $(\frac{b}{2})^2$.
	4)	Add what you got from #3 to both sides of the equation.
	5)	Rewrite the trinomial as a binomial squared.
	6)	Solve using Square Root Property .

Examples: Completing the Square

<p>1) $x^2 - 18x + 56 = 0$</p> <p style="text-align: center;">+56 -56 -56</p> <hr/> <p>$x^2 - 18x + 81 = -56 + 81$</p> <p style="text-align: center;">Perfect Square Trinomial</p> <p>$(x - 9)^2 = 25$</p> <p>$x - 9 = \pm 5$</p> <p>$x = 9 \pm 5$</p> <p style="text-align: right;">$x = 14$ $x = 4$</p> <p><i>(always positive)</i></p>	<p>2) $2x^2 - 16x = 30$</p> <p style="text-align: center;">2 16 30</p> <hr/> <p>$x^2 - 8x + 16 = 15 + 16$</p> <p>$(x - 4)^2 = 31$</p> <p>$x - 4 = \pm \sqrt{31}$</p> <p>$x = 4 \pm \sqrt{31}$</p>
<p>3) $x^2 + 16x - 21 = -5$</p> <p style="text-align: center;">+21 +21</p> <hr/> <p>$x^2 + 16x + 64 = 16 + 64$</p> <p>$(x + 8)^2 = 80$</p> <p>$x + 8 = \pm 4\sqrt{5}$</p> <p>$x = -8 \pm 4\sqrt{5}$</p>	<p>4) $3x^2 - 30x = 69$</p> <p style="text-align: center;">3 30 69</p> <hr/> <p>$x^2 - 10x + 25 = 23 + 25$</p> <p>$(x - 5)^2 = 48$</p> <p>$x - 5 = \pm 4\sqrt{3}$</p> <p>$x = 5 \pm 4\sqrt{3}$</p>
<p>5) $x^2 + 12x - 43 = 0$</p> <p style="text-align: center;">+43 +43</p> <hr/> <p>$x^2 + 12x + 36 = 43 + 36$</p> <p>$(x + 6)^2 = 79$</p> <p>$x + 6 = \pm \sqrt{79}$</p> <p>$x = -6 \pm \sqrt{79}$</p>	<p>6) $4x^2 - 76 = 16x$</p> <p style="text-align: center;">-16x -16x 76</p> <hr/> <p>$x^2 - 4x + 4 = 19 + 4$</p> <p>$(x - 2)^2 = 23$</p> <p>$x - 2 = \pm \sqrt{23}$</p> <p>$x = 2 \pm \sqrt{23}$</p>

Unit 28 Day 6 Notes Cont.

$$7). \quad x^2 - 4x + \cancel{4} = -5$$

$$\begin{array}{l} \left(\frac{-4}{2}\right)^2 \\ \downarrow \\ (-2)^2 \\ \downarrow \\ 4 \end{array} \quad \frac{x^2 - 4x + 4 = -6 + 4}{\sqrt{(x-2)^2} = \sqrt{-2} = i\sqrt{2}}$$

$$\frac{x - \cancel{2} \pm i\sqrt{2}}{\pm 2 \pm 2}$$

$$\underline{x = 2 \pm i\sqrt{2}}$$

$$8). \quad x^2 + 2x = -20$$

$$\begin{array}{l} \left(\frac{2}{2}\right)^2 \\ \downarrow \\ (1)^2 \\ \downarrow \\ 1 \end{array} \quad \frac{x^2 + 2x + 1 = -20 + 1}{\sqrt{(x+1)^2} = \sqrt{-19} = i\sqrt{19}}$$

$$\frac{x + 1 = \pm i\sqrt{19}}{-1 \quad -1}$$

$$\underline{x = -1 \pm i\sqrt{19}}$$

Unit 2B Day 6 HW

Solve each equation by completing the square. Simplify all irrational and complex solutions.

1) $x^2 + 4x + 4 = 49$

2) $x^2 - 12x + 36 = 80$

3) $x^2 + 10x - 96 = 0$

4) $x^2 = 16x - 63$

5) $3x^2 - 6x - 45 = 0$

6) $4x^2 + 24x = -36$

7) $x^2 + 2x - 37 = 0$

8) $2x^2 - 20x - 89 = -87$

Unit 28 Day 6 HW Cont.

$$9). x^2 - 8x = -55$$

$$10). 3x^2 + 9 = 6x$$