6.4 Completing the Square Day 1

Objective: Solve quadratic equations by using the Square Root Property and completing the square.

Square Root Property

$x^2 = n$

$x = \pm\sqrt{n}$

EX 1. $x^2 + 10x + 25 = 49$

$(x+5)(x+5) = 49$

$\sqrt{(x+5)^2} = \sqrt{49}$

$x + 5 = \pm 7$

$-5 \quad -5$

$x = -5 \pm 7$

$-5+7 = 2$

$-5-7 = -12$

$x = 2, -12$

EX 2. $x^2 + 14x + 49 = 64$

$(x+7)(x+7) = 64$

$\sqrt{(x+7)^2} = \sqrt{64}$

$x + 7 = \pm 8$

$x = -7 \pm 8$

$-7+8$

$-7-8$

$x = 1, -15$

EX 3. $x^2 - 10x + 25 = 12$

$(x-5)(x-5) = 12$

$\sqrt{(x-5)^2} = \sqrt{12} \rightarrow \sqrt{4}\sqrt{3}$

$x - 5 = \pm 2\sqrt{3}$

$x = 5 \pm 2\sqrt{3}$

EX 4. $x^2 - 6x + 9 = 32$

$(x-3)(x-3) = 32$

$\sqrt{(x-3)^2} = \sqrt{32}$ $\sqrt{16}\sqrt{2}$

$x - 3 = \pm 4\sqrt{2}$

$x = 3 \pm 4\sqrt{2}$

II. Find the value of C that makes each trinomial a perfect square. Then write each as a perfect square.

a b c $\frac{1}{2}$ of b and then square it!

EX 5. $x^2 + 16x + c$

$\frac{1}{2} \cdot 16 = 8$ $8^2 = 64$ $c = 64$

$(x+8)^2$

EX 6. $x^2 + 12x + c$

$\frac{1}{2} \cdot 12 = 6 \rightarrow 6^2 = 36$ $c = 36$

$(x+6)^2$

EX 7. $x^2 - 5x + c$

$5 \cdot \frac{1}{2} = \frac{5}{2} \rightarrow \left(\frac{5}{2}\right)^2 = \frac{25}{4} = c$

$\left(x - \frac{5}{2}\right)^2$

EX 8. $x^2 - .8x + c$

$\frac{1}{2} \cdot .8 = .4 \rightarrow (.4)^2 = .16 = c$

$(x-.4)^2$

EX 9. $x^2 + 1.2x + c$

$\frac{1}{2}(1.2) = .6 \rightarrow (.6)^2 = .36 = c$

$(x+.6)^2$

From your homework....

F O L

18. $4x^2 - 28x + 49 = 5$

$(2x-7)(2x-7) = 5$

$\sqrt{(2x-7)^2} = \sqrt{5}$

$2x - 7 = \pm\sqrt{5}$

$+7 \quad +7$

$2x = 7 \pm \sqrt{5}$

$x = \frac{7 \pm \sqrt{5}}{2}$