3/20 Algebra 1 - Downing

Go over HW

Unit 8: Solving Quadratics

Lesson 2: Completing the Square Day 1

Ex) $(x+2)^2 = 9$

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

$x+2 = 3$ or -3

$-2 \quad -2 \quad -2$

$x = 1$ or -5

Ex) $(x-3)^2 = 20$

$\sqrt{(x-3)^2} = \sqrt{20}$

$x-3 = 4.47$ or -4.47

$+3 \quad +3 \quad +3$

$x = 7.47$ or -1.47

Perfect Square Trinomial

Ex) Factor x^2+6x+9 (a b c)

a·c = 9

1	9
3	3

$(x+3)(x+3)$

$(x+3)^2$

Ex) $x^2+10x+25$ (a b c)

25	
1	25
5	5

$(x+5)(x+5)$

$(x+5)^2$

Ex) $x^2-20x+100$

$(x-10)(x-10)$

$(x-10)^2$

100	
1	100
2	50
4	25
5	20
-10	-10

Ex) $x^2-12x+36$

$(x-6)^2$

36	
-6	-6

Ex) $x^2+6x+\underline{9} = 36+\underline{9}$

$(x+3)^2 = 45$

$\sqrt{(x+3)^2} = \sqrt{45}$

$x+3 = 6.71$ or -6.71

$-3 \quad -3 \quad -3$

$x = 3.71$ or -9.71

Ex) $x^2-12x+\underline{36} = 45+\underline{36}$

$(x-6)^2 = 81$

$\sqrt{(x-6)^2} = \sqrt{81}$

$x-6 = 9$ or -9

$+6 \quad +6 \quad +6$

$x = 15$ or -3

Ex) $x^2 + 8x - 12 = 0$
a b c

* Cannot be factored

$a \cdot c = -12$

-1	12
-2	6
-3	4

Completing the Square

Steps	Example
1) Get ax^2+bx alone	$x^2+8x-12=0$, $+12$ $+12$, $x^2+8x+\_\_\_ = 12+\_\_\_$
2) If $a \neq 1$, divide all terms by a to get "x^2"	
3) Complete the square by adding $\left(\frac{b}{2}\right)^2$	$x^2+8x+16 = 12+16$
4) Factor the perfect square trinomial	$(x+4)^2 = 28$
5) Square Root both sides (Remember $\pm$)	$\sqrt{(x+4)^2} = \sqrt{28}$, $x+4 = 5.29$ or -5.29, -4 -4 -4
6) Solve for x	$x = 1.29$ or -9.29

Ex) $\frac{3x^2}{3} - \frac{24x}{3} - \frac{27}{3} = \frac{0}{3}$

$x^2 - 8x - 9 = 0$, $+9$ $+9$

$x^2 - 8x + 16 = 9 + 16$

$\sqrt{(x-4)^2} = \sqrt{25}$

$x - 4 = 5$ or -5, $+4$ $+4$ $+4$

$x = 9$ or -1

HW - Worksheet #1, 3, 5, 7