W-AZ Algebra 2 Week 24

Completing the square

Quadratic form

$ax^2 + bx + c = y$

slope: a — y-int: c

Vertex form

$a(x-h)^2 + k = y$

slope: a — vertex: (h, k)

$y = x^2 - 2x - 3$

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

$b = -2$

$+1 \quad -1$

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

$(-1)^2 = 1$

$y = (x^2 - 2x + 1) - 3 - 1$

$y = (x^2 - 2x + 1) - 4$

$\sqrt{x^2} \quad \sqrt{1}$

$y = (x - 1)^2 - 4$

$(1, -4)$

Step 1: zero it

Step 2: factor out "a" term

Step 3: $\left(\frac{b}{2}\right)^2$

Step 4: Square Roots

Vertex: $(1, -4)$

Completing the Square to solve for X.

$$x^2 - 2x - 3 = 8$$
$$+3 \quad +3$$

$$x^2 - 2x = 11$$

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

$$x^2 - 2x + 1 = 11 + 1$$

$$x^2 - 2x + 1 = 12$$

$$\sqrt{(x-1)^2} = \sqrt{12}$$

$$x - 1 = \pm\sqrt{12}$$
$$+1 \qquad +1$$

$$x = \pm\sqrt{12} + 1$$

$\sqrt{12}$

$\sqrt{4}$ $\sqrt{3}$

$2\sqrt{3}$

$$x = \pm 2\sqrt{3} + 1$$

$2\sqrt{3} + 1$ and $-2\sqrt{3} + 1$

Complete the Square

step 1: 2020

step 2: factor out "a"

step 3: $\left(\frac{b}{2}\right)^2$

step 4: Square Root

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

$$y = (x^2 + 4x) + 6$$

$b = 4$

$+4 \quad -4$

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

$$y = (x^2 + 4x + 4) + 6 - 4$$

$$y = (x^2 + 4x + 4) + 2$$

$\sqrt{x^2}$ $\sqrt{4}$

$$(x + 2)^2 + 2$$

Vertex: $(-2, 2)$

$(x+2)^2 = (x+2)(x+2)$ FOIL

$x^2+2x+2x+4$

x^2+4x+4

$y = -2x^2 + 12x - 8$

$(-2x^2+12x) - 8$

$\frac{-2}{-2} \quad \frac{12x}{-2}$

$-2(x^2-6x+\boxed{+9}) - 8 + 18$

$(\frac{-6}{2})^2$

$(-3)^2$

9

$+9 \quad (-9)(-2)$

$-2(x^2-6x+9) + 10$

$\sqrt{x^2} \quad \sqrt{9}$

$y = -2(x-3)^2 + 10$

Step 1: 2020

Step 2: factor out "a"

Step 3: $(\frac{b}{2})^2$

Step 4: Square last

Vertex: $(3, 10)$

Factoring Quadratics

$y = ax^2 + bx + c$ $\quad ax^2 + bx + c = 0$

y → 0

$+$ → same sign

$-$ → different signs

$x^2 - 7x + 10 = 0$

$-2 * -5 = 10$

$-2 + -5 = -7$

$(x-2)(x-5)$

$x^2 - 5x - 2x + 10$

$x^2 - 7x + 10$

← up to 2 possible answers

$x^2 + 13x + 36 = 0$

$9 * 4 = 36$

$9 + 4 = 13$

$(x+9)(x+4) = 0$

$x+9=0 \quad x+4=0$

$-9 \ -9 \quad -4 \ -4$

$x = -9, -4$

Factors of 10

$2 * 5$

$1 * 10$

$x^2 - 7x + 10 = 0$

$(x-2)(x-5) = 0$

$x - 2 = 0 \quad x - 5 = 0$

$+2 \ +2 \quad +5 \ +5$

$x = 2 \quad x = 5$

$x^2 + 7x - 30 = 0$

− different signs

30
1 30
3 10
5 6

$10 * -3 = -30$

$10 + -3 = 7$

$(x+10)(x-3) = 0$

$x+10=0 \quad x-3=0$

$-10 \ -10 \quad +3 \ +3$

$x = -10 \quad x = 3$

Difference of Squares

$x^2 - 64 = 0$

perfect square: $\sqrt{x^2}$ | minus | perfect square: $\sqrt{64}$

$(x+8)(x-8) = 0$

$x^2 - 64 = 0$
$+64 \quad +64$

$\sqrt{x^2} = \sqrt{64}$

$x = \pm 8$

$x+8=0 \qquad x-8=0$
$-8 \quad -8 \qquad +8 \quad +8$

$x = -8 \qquad x = +8$

$a \neq 1$

$2x^2 - 10x - 28 = 0$
$\frac{}{2} \quad \frac{}{2} \quad \frac{}{2}$

$2(x^2 - 5x - 14) = 0$

14
$2 \quad 7$
$1 \quad 14$

$2 * -7 = -14$

$2 + -7 = -5$

switch the sign

$(x+2)(x-7) = 0$

$x+2=0 \qquad x-7=0$
$-2 \quad -2 \qquad +7 \quad +7$

$x = -2 \qquad x = 7$

$x^2 + 11x = 0$

$(x)(x+11) = 0$

$x = 0$

$x+11=0$
$-11 \quad -11$

$x = 0, -11$

$x^2 + 4x - 20 = 1$ Get $\emptyset$

$-1 \quad -1$

$x^2 + 4x - 21 = 0$

HW

Ch 5.4 evens

5.5 evens

* Supplemental WS

Online HW 24 } due April 7th

Quiz 24

HW/Quiz 23 due March 26th