T-A2 Algebra 2 Week 28 4/18

$(2i+3)(4i-5)$ FOIL

$8i^2 - 10i + 12i - 15$

$i^2 = -1$

$8i^2 = 8(-1) = -8 - 10i + 12i - 15$

$-23 + 2i$

complex number both real and imaginary terms

$i^2 = \sqrt{-1} \cdot \sqrt{-1} = -1$

$(-1)^{\frac{1}{2}}(-1)^{\frac{1}{2}} = -1^{\frac{1}{2}+\frac{1}{2}} = -1^1 = -1$

$(8-3i)(4+2i)$ FOIL

$32 + 16i - 12i - 6i^2$

$-6i^2 = (-6)(-1) = +6$

$32 + 16i - 12i + 6$

$38 + 4i$

$x^2 + 20x + 75 = 0$ **Vertex**

1.) Find zeros — take their average

$(x+5)(x+15) = 0$

$5 * 15 = 75$

$5 + 15 = 20$

$x+5=0$ $\quad x+15=0$

$-5\ -5$ $\quad -15\ -15$

$x = -5$ $\quad x = -15$

zeros

$\frac{-5+(-15)}{2} = \frac{-20}{2} = -10$

$h = -10$

2.) $\frac{-b}{2a}$ $\quad x^2 + 20x + 75$

$a = 1 \quad b = 20 \quad c = 75$

$\frac{-20}{2(1)} = \frac{-20}{2} = -10 = h$

Discriminant — # of real zeros

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$h = -10$

$x^2 + 20x + 75$

$(-10)^2 + 20(-10) + 75$

$100 - 200 + 75$

$-100 + 75 = -25 = k$

Vertex $(-10, -25)$

Completing the Square

1.) 2020 it
2.) Factor out an "a"
3.) $\left(\frac{b}{2}\right)^2$

$$x^2 + 20x + 75 = 0$$

$$(x^2 + 20x) + 75 = 0$$

$b = 20$ $\left(\frac{b}{2}\right)^2 = \left(\frac{20}{2}\right)^2 = 10^2 = 100$

$$(x^2 + 20x) + 75 = 0$$

$+100$ -100

$$(x^2 + 20x + 100) + 75 - 100 = 0$$

$$(x^2 + 20x + 100) - 25 = 0$$

$\sqrt{x^2}$ $\sqrt{100}$

$$(x + 10)^2 - 25 = 0$$

vertex form

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

(h, k) vertex

$(-10, -25)$

$h = -10$ $k = -25$

$$(x+10)^2 = (x+10)(x+10) = x^2 + 10x + 10x + 100$$

$$x^2 + 20x + 100$$

$$(x+10)^2 - 25 = 0$$

$$+25 \quad +25$$

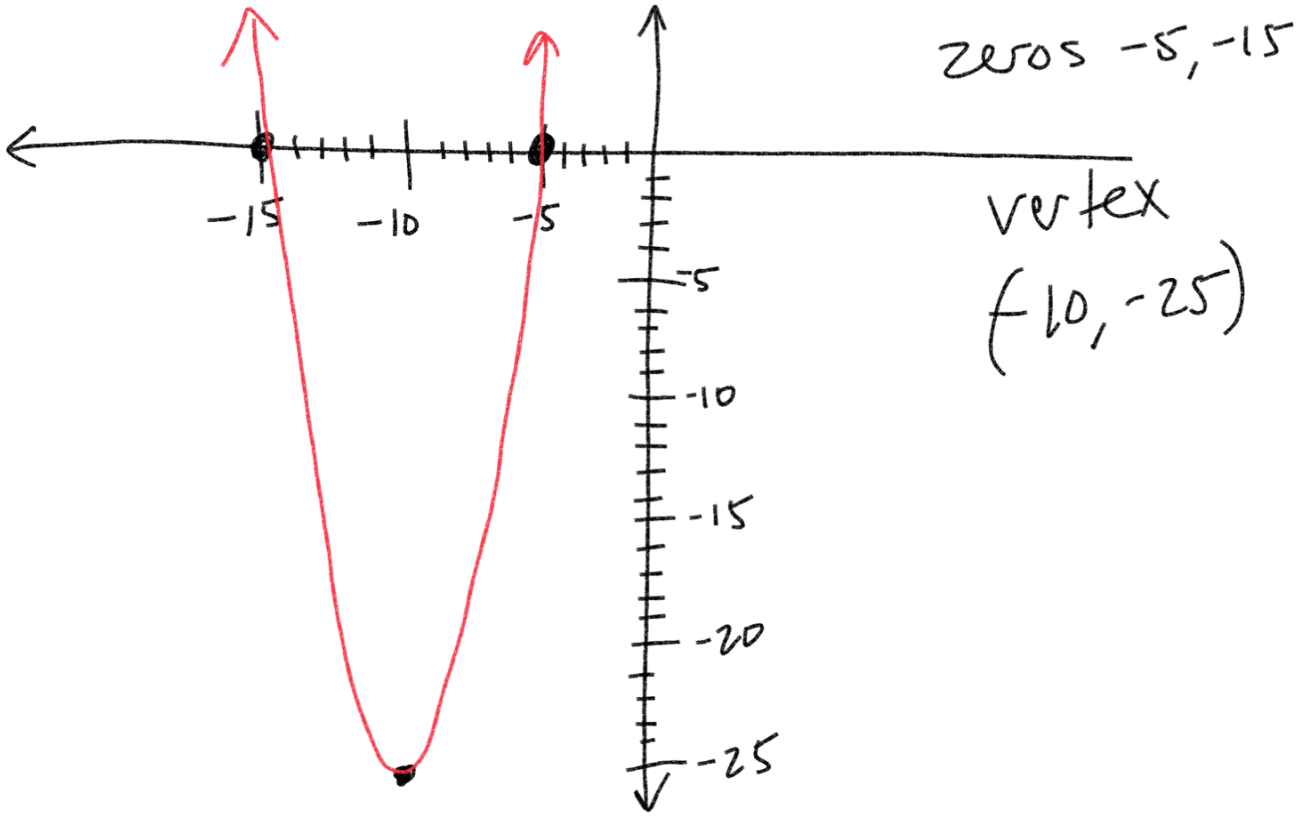
$$\sqrt{(x+10)^2} = \sqrt{25}$$

$$x + 10 = \pm 5$$

$$-10 \quad -10$$

$$x = -10 \pm 5$$

$-10 + 5 = -5$ $\quad -10 - 5 = -15$



zeros $-5, -15$

vertex

$(-10, -25)$

$x^2 + 16x + 48 = 0$

convert to vertex form

1.) 2020 it

2.) Factor out "a" term

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

4.) Square root first & last

$(x^2 + 16x) + 48 = 0$

$\left(\frac{16}{2}\right)^2 = (8)^2 = 64$ $\quad -64$

$(x^2 + 16x + 64) + 48 - 64 = 0$

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

$(x + 8)^2 - 16 = 0$

$-h$ $\quad k$

vertex: $(-8, -16)$

Find zeros

$(x+8)^2 - 16 = 0$

$+16 \quad +16$

$\sqrt{(x+8)^2} = \sqrt{16}$

$x + 8 = \pm 4$

$-8 \quad -8$

$x = -8 \pm 4$

$-8+4 = -4$ $\quad -8-4 = -12$

$2x^2 + 8x + 6 = 0$

$\left(\frac{2x^2}{2} + \frac{8x}{2}\right) + 6 = 0$

$2(x^2 + 4x) + 6 = 0$

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

$2(x^2 + 4x + 4) + 6 - 8 = 0$

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

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

$-h \quad k$

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

$+2 \quad +2$

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

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

$x + 2 = \pm 1$

$-2 \quad -2$

$x = -2 \pm 1$

$x = -2+1 \quad x = -2-1$

$-1 \quad -3$

1.) 2020 it

2.) Factor out "a"

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

4.) Square root 1st & 3rd

vertex: $(-2, -2)$