W-AZ Algebra 2 Week 28 4/17

FOIL

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

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

$8(-1) - 10i + 12i - 15$

$-8 + 2i - 15$

$-8 - 15$

$-8 + (-15)$

-23

$\boxed{-23 + 2i}$

real imaginary

$i^2 = i \cdot i = -1$

$\sqrt{-1} \cdot \sqrt{-1} = -1$

$\sqrt{4} \cdot \sqrt{4} = \sqrt{16} = 4$

$\sqrt{4} \cdot \sqrt{4} = 4$

$\sqrt{7} \cdot \sqrt{7} = 7$

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

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

$32 + 16i - 12i + 6$

$\boxed{38 + 4i}$

$-6i^2$

$-6(-1) = +6$

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

Quadratic formula

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

h

Discriminant

1.) $h = \frac{-b}{2a}$

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

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

vertex $(-10, -25)$

to find k...

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

$100 - 200 + 75 = -100 + 75 = -25 = k$

2.) Find the zeros → take the average

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

$\_\_ * \_\_ = 75$

$\_\_ + \_\_ = 20$

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

$-5 \quad -15$

Average of zeros

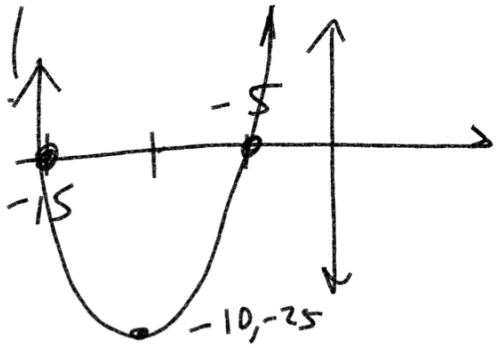
$h = \frac{-15 + (-5)}{2} = \frac{-20}{2} = -10$

$k = (-10+5)(-10+15)$

$(-5)(5) = -25$

vertex: $(-10, -25)$

Completing the Square!



"a"

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

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

+100 −100

$b = 20$

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

1.) 2020 it

2.) factor out "a" term

3.) $\left(\frac{b}{2}\right)^2$ add inside sub outside

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

4.) square root first and last

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

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

$(x + 10)^2 - 25$

vertex form

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

opposite

$(-10, -25)$ vertex

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

$x^2 + 10x + 10x + 100$

$x^2 + 20x + 100$

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

Convert to vertex form.

1.) 2020 it.

2.) factor out "a"

3.) $\left(\frac{b}{2}\right)^2 \rightarrow$ add inside sub outside

4.) Square root the first and last

$\left(x^2 + 16x\right) + 48 = 0$

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

$8^2 = 64$

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

$(x^2 + 16x + 64) - 16$

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

$(x+8)^2 - 16$

vertex: (h, k)

$\boxed{(-8, -16)}$

Find zeros

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

$+16 \quad +16$

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

$\sqrt{16} = \pm 4$

$x + 8 = \pm 4$

$-8 \quad -8$

$x = -8 \pm 4$

$-8 + 4 \qquad -8 - 4$

$(-4) \qquad (-12)$

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

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

$\frac{}{2}$ $\frac{}{2}$

1.) 2020 it

2.) factor out "a"

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

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

$\left(\frac{4}{2}\right)^2$ $+4$ $-4(2)$ "a"

$2^2 = 4$

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

$2(x^2 + 4x + 4) - 2$

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

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

vertex: $(-2, -2)$