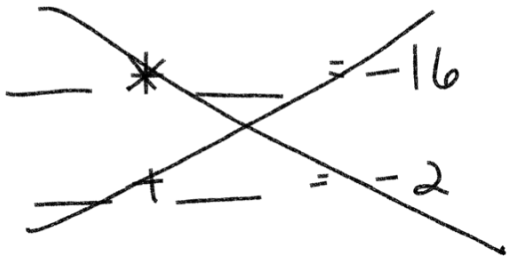
T-A2 Algebra 2 Week 26 3/19

$x^2 - 2x - 16 = 0$

4 * 4
2 * 8
1 * 16



Quadratic Formula

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

$a = 1 \quad b = -2 \quad c = -16$

$$\frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-16)}}{2(1)}$$

$$\frac{2 \pm \sqrt{4 + 64}}{2}$$

Simplify $\sqrt{68}$

Look for perfect squares

$\sqrt{68}$

$\sqrt{4} \cdot \sqrt{17}$

$2\sqrt{17}$

$$\frac{2 \pm \sqrt{68}}{2} = \frac{2 \pm 2\sqrt{17}}{2}$$

+3 +5 +7 +9 +11 +13 +15 +17 +19 +21

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121

$$1 \pm \sqrt{17}$$

$$1+\sqrt{17}, \quad 1-\sqrt{17}$$

$x^2 - 2x - 16 = 0$

Find vertex

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

vertex: $(1, -17)$

$x^2 - 2x - 16 =$

$(1)^2 - 2(1) - 16$

$1 - 2 - 16 = -1 - 16 = -17$

or...

take the average of the zeros

$\frac{1 \oplus \sqrt{17} + 1 \ominus \sqrt{17}}{2} + \frac{2}{2}$

Quadratic Formula

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

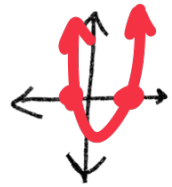
discrimnant (1)

# of zeros possible (2)

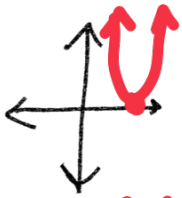
$y = ax^2 + bx + c$

if.... $b^2 - 4ac > 0 \rightarrow$ 2 zeros

$\oplus$

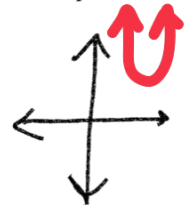


$b^2 - 4ac = 0 \rightarrow$ 1 zero



$b^2 - 4ac < 0 \rightarrow$ 0 zeros

$\ominus$



$x^2 + 4x - 18 = 0$

Find zero(s).
Use discrimnant to confirm # of zeros

$a = 1 \quad b = 4 \quad c = -18$

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

$$\frac{-4 \pm \sqrt{(4)^2 - 4(1)(-18)}}{2(1)} = \frac{-4 \pm \sqrt{16 + 72}}{2}$$

$$\frac{-4 \pm \sqrt{88}}{2}$$

According to discrim, 2 zeros

$\sqrt{88}$
$\sqrt{4} \quad \sqrt{22}$
$2\sqrt{22}$

$$\frac{-2}{\cancel{-4 \pm 2\sqrt{22}}}{\cancel{2}} = \boxed{-2 \pm \sqrt{22}}$$

$-2 + \sqrt{22}$ and $-2 - \sqrt{22}$

$x^2 + 4x + 12 = 0$

$a = 1 \quad b = 4 \quad c = 12$

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

$$\frac{-4 \pm \sqrt{(4)^2 - 4(1)(12)}}{2(1)}$$

$$\frac{-4 \pm \sqrt{16 - 48}}{2} = \frac{-4 \pm \sqrt{-32}}{2}$$

$\emptyset$ zeros

$\sqrt{-32} = \sqrt{-1} \cdot \sqrt{32}$
$i\sqrt{32}$
$i \cdot \sqrt{16} \cdot \sqrt{2}$
$4i\sqrt{2}$

$$\frac{-4 \pm 4i\sqrt{2}}{2} \quad \frac{-2}{2} \quad \frac{2}{2} \quad \boxed{-2 \pm 2i\sqrt{2}}$$

$\sqrt{-1} = i$

$3x^2 + 2x + 8 = 0$

$a = 3 \quad b = 2 \quad c = 8$

Discrimnant

$-92 \rightarrow \not\exists$ zeros

h term in the vertex

$\frac{-2}{6} = \frac{-1}{3}$

$\sqrt{-92} = \sqrt{-1} \cdot \sqrt{92}$

$i\sqrt{92}$

$i \cdot \sqrt{4} \cdot \sqrt{23}$

$2i\sqrt{23}$

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

$$\frac{-2 \pm \sqrt{(2)^2 - 4(3)(8)}}{2(3)}$$

$$\frac{-2 \pm \sqrt{4 - 96}}{6}$$

$$\frac{-2 \pm \sqrt{-92}}{6}$$

$$\frac{-2 \pm 2i\sqrt{23}}{6} \quad (\div 2)$$

$$\boxed{\frac{-1 \pm i\sqrt{23}}{3}}$$

$3x^2 + 2x + 8$

$3 \cdot 1 \qquad 8 \cdot 1$

$4 \cdot 2$

	$3x$	2
$1x$	$3x^2$	$2x$
4	$12x$	8

$12x + 2x = 14x$