

DRILL

① Simplify: $\sqrt{-18} = \sqrt{-1} \sqrt{18} = 3i\sqrt{2}$

② Simplify:

$$x = \frac{-4 \pm \sqrt{6^2 - 4(1)(5)}}{2(1)}$$

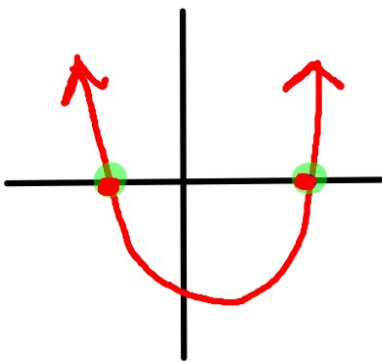
$$\begin{aligned} x &= 0 \\ x &= -4 \end{aligned}$$

$$x = \frac{-4 \pm \sqrt{36 - 20}}{2} = \frac{-4 \pm \sqrt{16}}{2}$$
$$\rightarrow x = \frac{-4 + 4}{2} = \frac{0}{2} = 0 \quad x = \frac{-4 - 4}{2} = \frac{-8}{2}$$

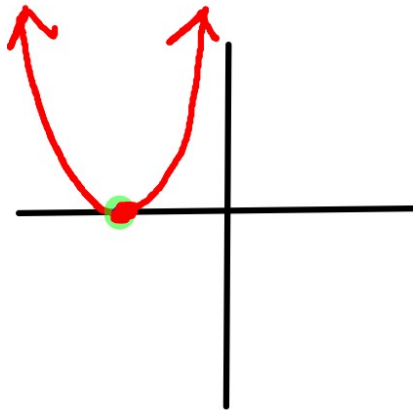
$x = -4$

$$x = \frac{-4 + 4}{2}$$

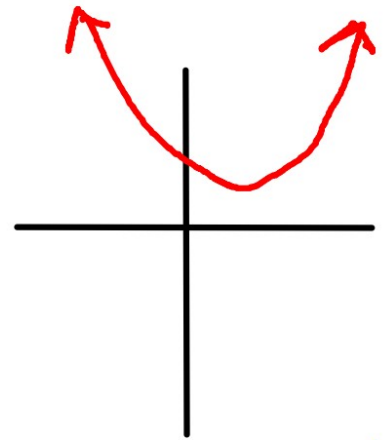
Quadratics



2 Real Solutions
(unique)



1 Real Solution
(unique)



0 real solutions
(imaginary roots)
solutions

2 imaginary
~~2~~

Ex: $x^2 + 4x + 8 = 0$

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

$a = 1$ $b = 4$ $c = 8$

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(8)}}{2(1)} = \frac{-4 \pm \sqrt{16 - 32}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16}}{2} = \frac{-4 \pm 4i}{2} = \boxed{-2 \pm 2i}$$

Ex: $ax^2 + bx + c = 0$
 $2x^2 + 2x + 3 = 0$

$a = 2$ $b = 2$ $c = 3$

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

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

$$x = \frac{-2 \pm \sqrt{4 - 24}}{4}$$

$$= \frac{-2 \pm \sqrt{-20}}{4}$$

$$= \frac{-2 \pm 2i\sqrt{5}}{4}$$

$$x = \frac{-\cancel{2} \pm \cancel{2}i\sqrt{5}}{2\cancel{4}}$$

$$= \frac{-1 \pm i\sqrt{5}}{2}$$

Ex: $a = 3$ $b = 4$ $c = 2$
 $3x^2 + 4x + 2 = 0$

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

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(3)(2)}}{2(3)} = \frac{-4 \pm \sqrt{16 - 24}}{6}$$

$$x = \frac{-4 \pm \sqrt{-8}}{6} = \frac{-4 \pm 2i\sqrt{2}}{6} = \frac{-2 \pm i\sqrt{2}}{3}$$