

Solving Quadratic Equations (Section 3-4)

* Ways to find a solution to a quadratic equation:

- Graphing
- Square Rooting
- Factoring
- Completing the Square
- Quadratic Formula

* A root, solution, factor, or zero of a quadratic equation

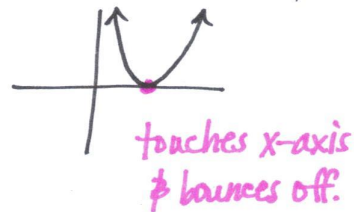
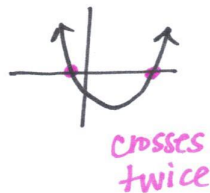
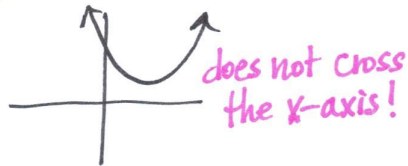
ALL mean \rightarrow find where it crosses the x-axis!

* Solve by Graphing: Graph by hand \rightarrow plot points

Use the calc \rightarrow intersect the quadratic w/ $y=0$.

* Quadratics can have 2 real solutions, 1 real solution, or

no real solution.



ex: $x^2 - 16 = 0 \rightarrow \boxed{x=4, -4}$

① set $y_1 = x^2 - 16$ / $y_2 = 0$ / ② get a good window!
 $\boxed{\text{ZOOM}}$ $\boxed{\#6}$

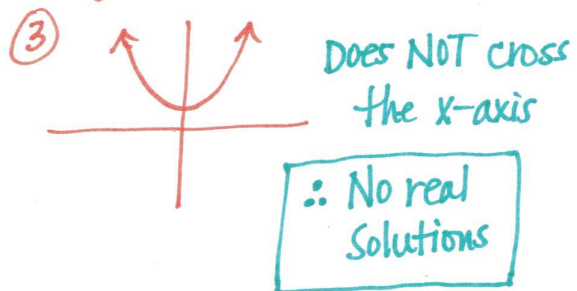
③ $\boxed{2^{\text{nd}}}$ $\boxed{\text{Trace}}$: Calculate
 $\boxed{\#5}$: Intersect
Scroll to the first zero
 $\boxed{\text{ENTER}}$ x 3.

④ Then do it again for the other zeros!

ex: $\frac{1}{2}x^2 + 1 = 0$

① set $y_1 = .5x^2 + 1$
 $y_2 = 0$

② get a good window



* Solving by using square roots:

REMEMBER that when you take a square root on both sides of the equation, you must have a " \pm "!

ex: $m^2 - 36 = 0$

$$\sqrt{m^2} = \sqrt{36}$$
$$m = \pm 6$$

ex: $3x^2 + 15 = 0$

$$\frac{3x^2}{3} = \frac{-15}{3}$$
$$\sqrt{x^2} = \sqrt{-5}$$

This is imaginary

\therefore No real solution

ex: $4g^2 = 25$

$$\frac{4g^2}{4} = \frac{25}{4}$$
$$\sqrt{g^2} = \sqrt{25/4}$$
$$g = \pm 5/2$$

ex: $2r^2 - 32 = 0$

$$\frac{2r^2}{2} = \frac{32}{2}$$

$$\sqrt{r^2} = \sqrt{16}$$

$$r = \pm 4$$

* In real-world problems, make sure your answer is reasonable!

ie. No negative time, neg. volume, ...