Key

Unit 8. Day 1
SOLVING BY GRAPHING (BY HAND!)

1. Graph the following quadratic equation: $y = x^2 - 2x - 3$ by identifying the following:

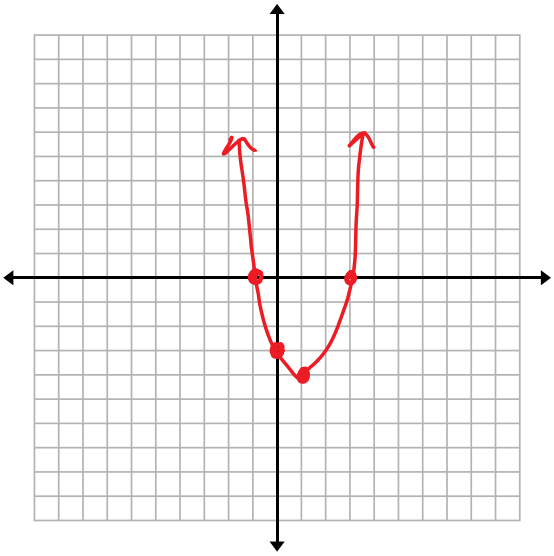
Axis of Symmetry: $\frac{2}{2(1)} = 1$ $x = 1$

Vertex: $(1, -4)$

$(1)^2 - 2(1) - 3$
$1 - 2 - 3$
$1 - 5$
-4

Circle One: Maximum or Minimum

y-intercept: $(0, -3)$



Identify the x-intercept(s): $(3, 0)$ $(-1, 0)$

Solve the quadratic by factoring: $x^2 - 2x - 3 = 0$

$(x - 3)(x + 1) = 0$
$x = 3$ $x = -1$

You try!

2. Graph the following quadratic equation: $y = -x^2 + 2x - 1$ by identifying the following:

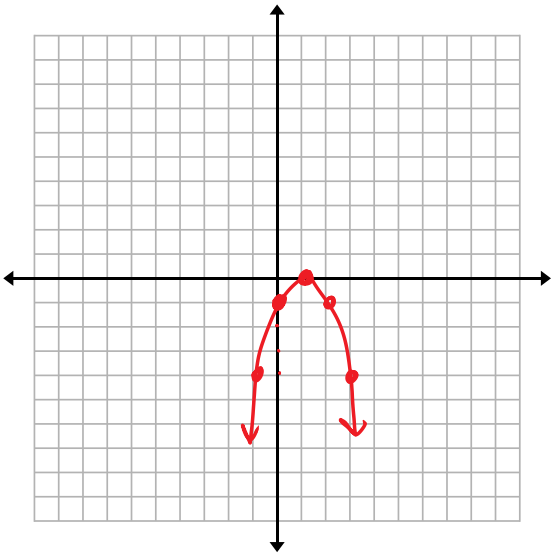
Axis of Symmetry: $\frac{-b}{2a} = \frac{-2}{2(-1)} = 1$ $x = 1$

Vertex: $(1, 0)$

$-1^2 + 2(1) - 1$
$-1 + 2 - 1$
0

Circle One: Maximum or Minimum

y-intercept: $(0, -1)$



Identify the x-intercept(s): $(1, 0)$

Double-check by factoring! $-x^2 + 2x - 1 = 0$

$-1(x^2 - 2x + 1) = 0$
$-1(x - 1)(x - 1) = 0$
$x = 1$

SOLVING BY GRAPHING (WITH A CALCULATOR!)

What happens if I don't have pretty, rational x-intercepts? For example … solve the following by factoring … $x^2 - 4x + 1 = 0$. Perhaps our calculator could help us! Take it out …

STEPS
① enter equation into y=
② zoom 6 → GRAPH
③ Find zero → 2ND TRACE
↓
ZERO
↓
Left/Right bound
enter

1. Solve $y = x^2 - 4x + 1$ by graphing.

(.26, 0) (3.73, 0)

Let's do another!

2. Solve $y = x^2 - 5x + 3$ by graphing.

(.69, 0) (4.3, 0)

Last one together!

3. Solve $y = 5x^2 - 3x + 1$ by graphing.

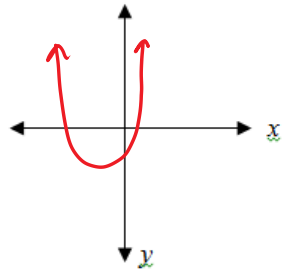
none

And one on your own …

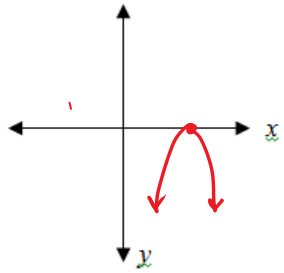
4. Solve $y = x^2 - 6x + 4$ by graphing.

(.76, 0) and (5.23, 0)

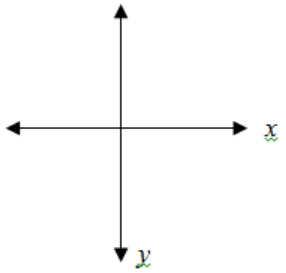
Number of Solutions of a Quadratic Equation



A quadratic equation has 2 solutions if the graph of its function has 2 x intercepts.



A quadratic equation has 1 solution if the graph of its function has 1 x intercept.



A quadratic equation has no real solution if the graph of its function has 0 x intercepts.