Warm Up April 2, 2019

1.) Factor the expression: $x^3 - 13x^2 + 42x$.

$a = 1$, $b = -13$, $c = 42$

42, -6, -7, -13

$x(x^2 - 13x + 42)$

$x(x-6)(x-7)$

2.) A rectangle has a length of x inches and a width 2 inches less than the length.

$x - 2$ inches

x inches

L + W

$\cdot 2$

If the dimensions were doubled, what would the area of the new rectangle be?

$A = lw$

$2(x) = 2x$

$2(x-2) = 2x-4$

$2x(2x-4) = 4x^2 - 8x = A_{R_2}$

Solving Quadratics by Graphing

Graphing Quadratic Equations

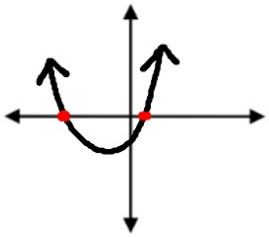
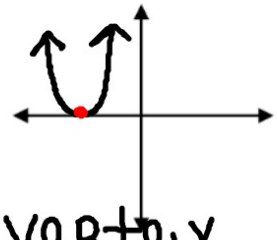
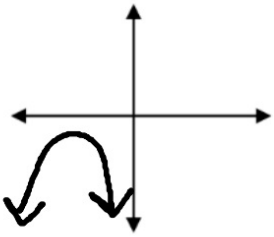
$$y = ax^2 + bx + c$$

Steps to graph a quadratic equation:

Step 1:	*Find the **axis of symmetry.***
Step 2:	*Find the **vertex.***
Step 3:	*Fill in a **table of values** using your calculator.*
Step 4:	***Graph!***

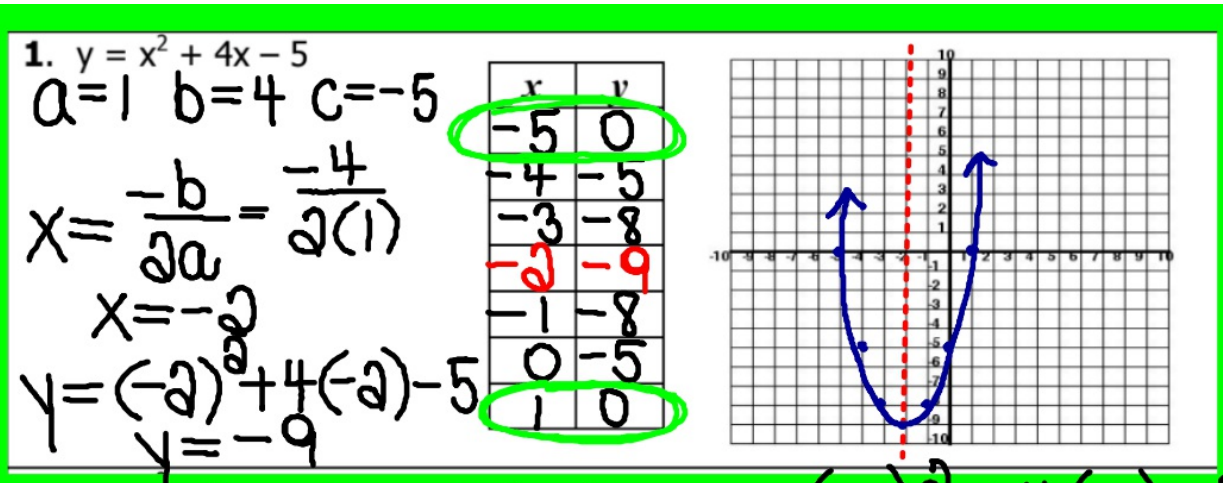
To solve focus on the locations where the crosses the x-axis - roots, x-intercepts, zeroes.

Topic: Identifying Quadratics Roots	Date:

Main Ideas/Questions	Notes
Definition	locations where the graph crosses the x-axis
Also called...	solutions, x-intercepts, zeros
Number of Solutions	2 SOLUTIONS  1 SOLUTION  NO SOLUTION 

Vertex

Roots



Roots: (-5,0) and (1,0)

1.) Calculate AOS: x = -b/2a

2.) Plug AOS into original function.

3.) Put vertex coordinates in the center of the table.

4.) Fill in the table.

5.) Plot the points and connect the curve.

6.) Determine the x-intercepts.

2. $y = x^2 - 2x + 1$

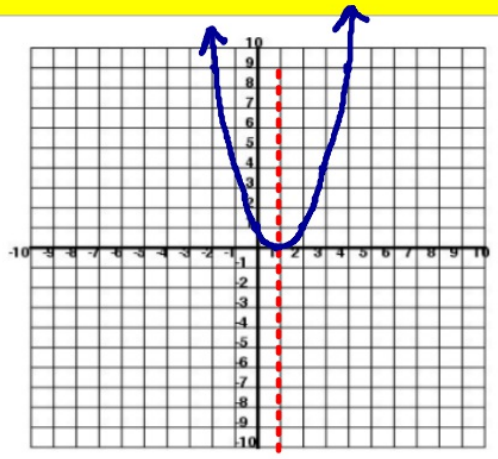
$a=1 \quad b=-2 \quad c=1$

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

$y = (1)^2 - 2(1) + 1$

$y = 0$

x	y
-2	9
-1	4
0	1
1	0
2	1
3	4
4	9



Roots: (1, 0)

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

1.) Calculate AOS: x = -b/2a

2.) Plug AOS into original function.

3.) Put vertex coordinates in the center of the table.

4.) Fill in the table.

5.) Plot the points and connect the curve.

6.) Determine the x-intercepts.

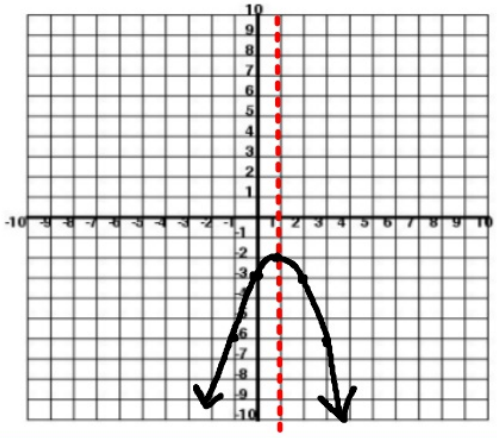
3. $y = -x^2 + 2x - 3$

$X = \frac{-2}{2(-1)} = 1$

$y = -(1)^2 + 2(1) - 3$

$y = -2$

x	y
-3	-11
-2	-6
-1	-3
0	-2
1	-2
2	-3
3	-6
4	-11



Roots: NO REAL ROOTS

1.) Calculate AOS: x = -b/2a

2.) Plug AOS into original function.

3.) Put vertex coordinates in the center of the table.

4.) Fill in the table.

5.) Plot the points and connect the curve.

6.) Determine the x-intercepts

6. $y = -x^2 - 4$

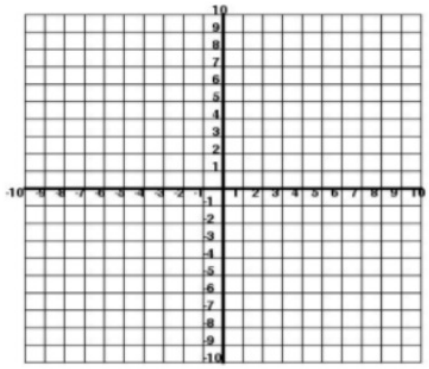
Axis of Symmetry: _____

Vertex: _____

Domain: _____

Range: _____

x	*y*



Roots: _____

7. $y = 2x^2 + 8x$

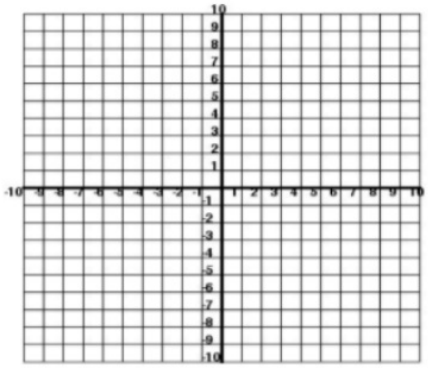
Axis of Symmetry: _____

Vertex: _____

Domain: _____

Range: _____

x	*y*



Roots: _____

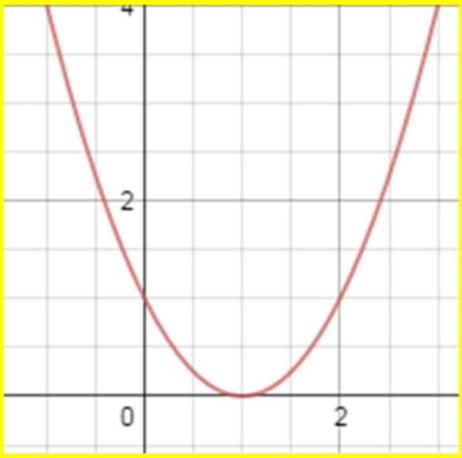
Ex. 3) What is the equation of the graph shown?

A. $y = -x^2 + 2x - 1$

B. $y = -x^2 - 2x - 1$

C. $y = x^2 - 2x + 1$

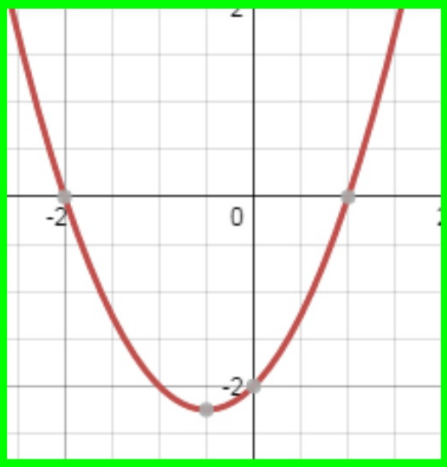
D. $y = x^2 + 2x + 1$



Does it have a maximum or a minimum?

Identify the AOS and vertex.

Ex. 4) What is the equation of the graph below?



A. $y = -x^2 - 2x + 2$

B. $y = x^2 - x - 2$

C. $y = x^2 + x + 2$

D. $y = x^2 + x - 2$

Exit Ticket

For the function below, list the following information.

$$y = x^2 - 8x + 12$$

Axis of Symmetry: _____

Vertex: _____

Maximum or Minimum: _____

Domain: _____ Range: _____

Roots: _____