Warm Up May 8, 2019

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

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

$a=1 \quad b=-13 \quad c=42$

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

$ac = 42$

1	42
2	21
3	14
−6	−7

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

3 (x inches)

3.

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

$3x(3x-6) = 9x^2 - 18x$ units^2

Features of Quadratics

$x = \frac{-b}{2a}$

$y = x^2 + 4x - 5$

$a=1 \quad b=4 \quad c=-5$

Axis of Symmetry: x = -2 Vertex: $(-2, -9)$

$x = \frac{-4}{2(1)} = \frac{-4}{2}$

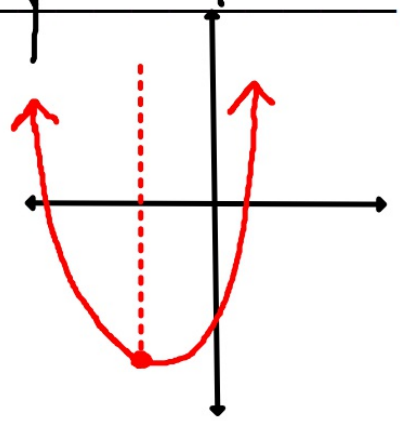
$y = (-2)^2 + 4(-2) - 5$

Min or Max: min

a = positive

Y - Intercept: $(0, -5)$

Domain: all Real #s Range: $y \geq -9$



Increasing Interval: $x > -2$

Decreasing Interval: $x < -2$

Solving Quadratics by Graphing

Graphing Quadratic Equations

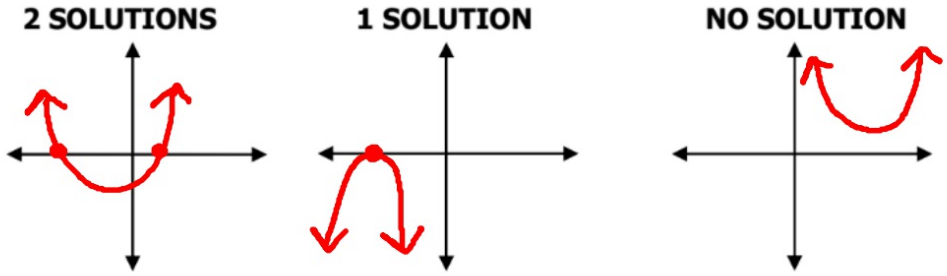
$$y = ax^2 + bx + c$$

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 graph 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	

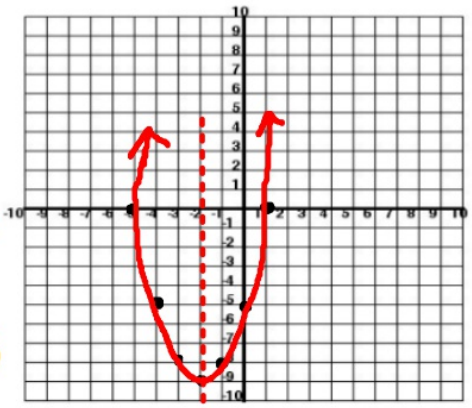
To solve focus on the locations where the graph crosses the x-axis - roots, x-intercepts, zeroes.

1. $y = x^2 + 4x - 5$

$X = -2$

$(-2, -9)$

x	y
-5	0
-4	-5
-3	-8
-2	-9
-1	-8
0	-5
1	0



Roots: (-5, 0) and (1, 0) ( )^2 + 4( ) − 5

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

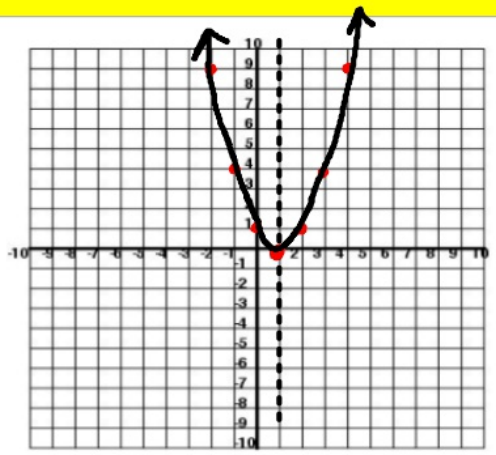
$a=1 \quad b=-2 \quad c=1$

$x=\frac{2}{2(1)}=1$

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

$y=0$

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.

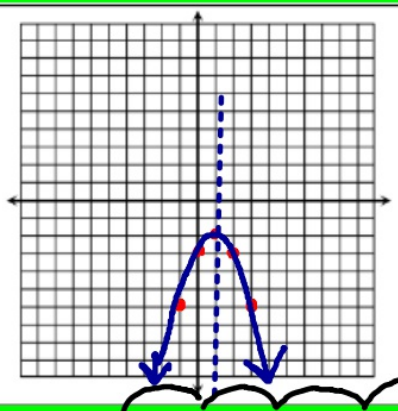
3. $y = -x^2 + 2x - 3$

$a=-1\ b=2\ c=-3$

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

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

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



no solution

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

2.) Plug AOS into original function.

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

Roots: _____

4.) Fill in the table.

5.) Plot the points and connect the curve.

6.) Determine the x-intercepts.

Roots: _____

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

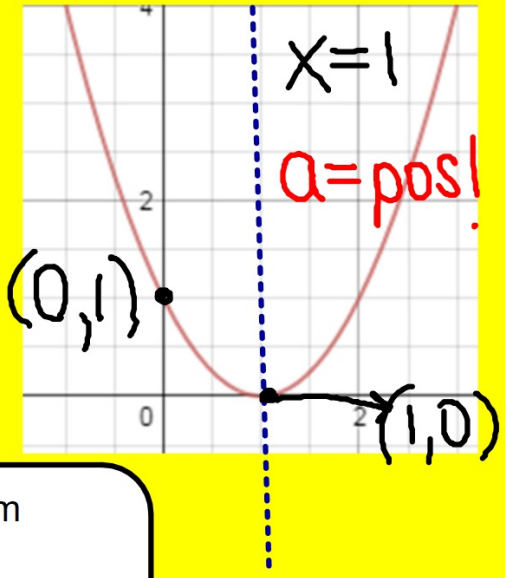
~~A. $y = -x^2 + 2x - 1$~~

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

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

$\frac{a}{2(1)} = 1$

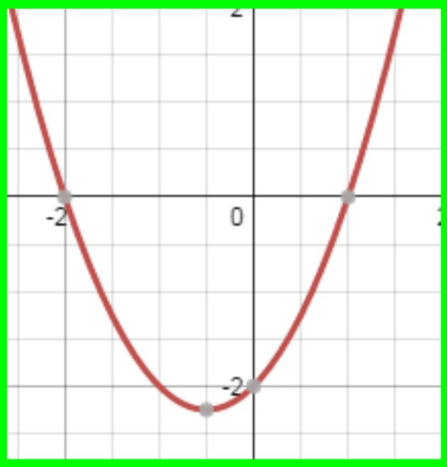
D. $y = x^2 + 2x + 1$



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

#1 $\frac{32a^2}{2} - \frac{18b^2}{2}$

$2(16a^2 - 9b^2)$

$2(4a+3b)(4a-3b)$

#18 $3x^4 + 6x^3 - 3x^2 - 6x$

$3x(x^3 + 2x^2 - x - 2)$

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

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

$3x(x+1)(x-1)(x+2)$

#19 $(4y-5)^2 - 3y(4y+5) - y + 27$

$16y^2 - 40y + 25 - 12y^2 - 15y - y + 27$

$4y^2 - 56y + 52$

$4(y^2 - 14y + 13)$

$4(y-1)(y-13)$