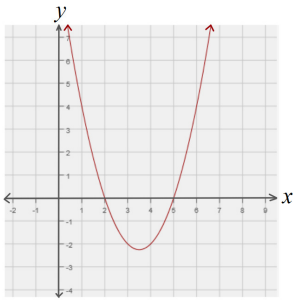
DO NOW

What are the roots of the graph below?

$x=2$ and $x=5$



8.5 Writing Quadratic Equations from Roots

Roots - Solutions
x-intercepts (GRAPH)
$y=0$ (TABLE)

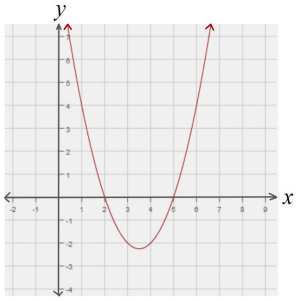
Procedure:

1. Write 2 roots in "$x=$" form.
2. Transform to a single equation $=0$.
3. Determine if the vertex is a maximum or minimum. Decide if a negative is needed.
4. Simplify and replace "$=0$" with "$y=$"

1. Write the quadratic equation for the given graph.

$x=2$ $\quad x=5$
$x-2=0$ OR $x-5=0$
$(x-2)(x-5)=0$
$x^2-5x-2x+10=0$
$x^2-7x+10=0$

$\boxed{y=x^2-7x+10}$



minimum
↳ no negative

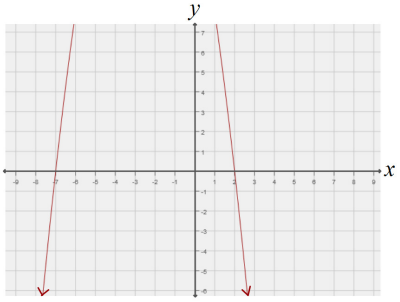
2. Write the quadratic equation for the given graph.

★ Need the roots
↳ x-intercepts

$x=-7$ $\quad x=2$
$x+7=0$ OR $x-2=0$
$-(x+7)(x-2)=0$
$-(x^2-2x+7x-14)=0$
$-(x^2+5x-14)=0$
$-x^2-5x+14=0$

$\boxed{y=-x^2-5x+14}$

maximum
↳ put in a negative



★ maximum
↳ include a negative

3. Write the quadratic equation for given table.

★ Need the roots
↳ look for $y=0$

$x=-1$ $\quad x=4$
$x+1=0$ or $x-4=0$
$(x+1)(x-4)=0$
$x^2-4x+x-4=0$
$x^2-3x-4=0$

$\boxed{y=x^2-3x-4}$

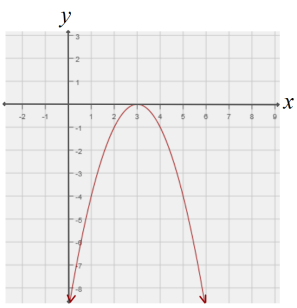
x	y	
-2	6	
-1	0	decreasing
0	-4	
1	-6	vertex
2	-6	
3	-4	
4	0	increasing
5	6	

★ MINIMUM
↑
no negative

4. Write the quadratic equation for the given graph.

$x=3$ $\quad x=3$
$x-3=0$ OR $x-3=0$
$-(x-3)(x-3)=0$
$-(x^2-3x-3x+9)=0$
$-(x^2-6x+9)=0$
$-x^2+6x-9=0$

$\boxed{y=-x^2+6x-9}$



maximum
↑ include a negative

5. Write the quadratic equation for the given table.

$x=-1 \qquad x=3$

$x+1=0$ or $x-3=0$

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

$-(x^2-3x+x-3)=0$

$-(x^2-2x-3)=0$

$-x^2+2x+3=0$

$\boxed{y=-x^2+2x+3}$

x	y	
-2	-5	
-1	0	increasing
0	3	
1	4	← vertex
2	3	
3	0	decreasing
4	-5	

maximum
↑ include a negative

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6. Write the quadratic equation for the given graph.

$x=-4 \qquad x=3$

$x+4=0$ or $x-3=0$

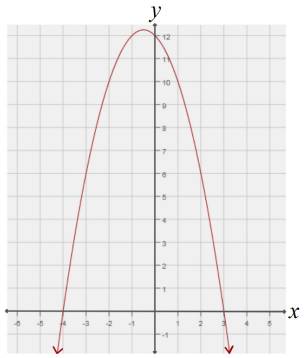
$-(x+4)(x-3)=0$

$-(x^2-3x+4x-12)=0$

$-(x^2+x-12)=0$

$-x^2-x+12=0$

$\boxed{y=-x^2-x+12}$



maximum
↳ include a negative

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HOMEWORK

Worksheet - HW 8.5 - Day 3

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