

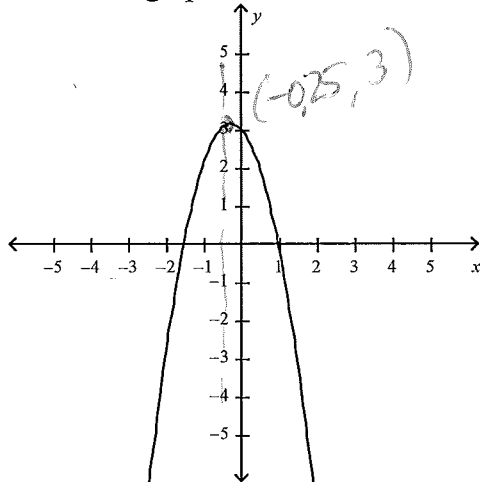
*key*

**Practice Test Questions**

**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

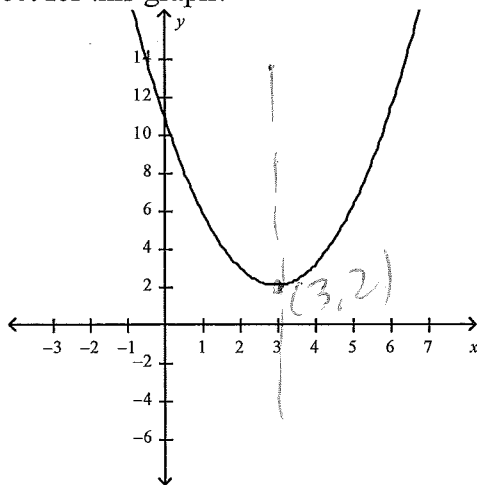
B 1. Which set of data is correct for this graph?



*has to be*

	Axis of Symmetry	Vertex	Domain	Range
A.	$x = -2$	$(-0.25, -3.125)$	$x \in \mathbb{R}$	$y \in \mathbb{R}$
<u>B.</u>	$x = -0.25$	$(-0.25, 3.125)$	$x \in \mathbb{R}$	$y \leq 3.125$
<del>C.</del>	$x = -0.5$	$(-0.5, 3)$	$-2.5 \leq x \leq 1.5$	$y \leq 3$
D.	$x = 3$	$(3, -0.5)$	$-3 \leq x \leq 2$	$y \leq 5$

A 2. Which set of data is correct for this graph?

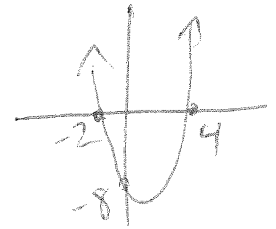


	Axis of Symmetry	Vertex	Domain	Range
<u>A.</u>	$x = 3$	$(3, 2)$	$x \in \mathbb{R}$	$2 \leq y$
B.	$x = 3$	$(2, 3)$	$x \in \mathbb{R}$	$y \in \mathbb{R}$
C.	$x = 2$	$(2, 3)$	$-1 \leq x \leq 7$	$2 \leq y$
D.	$x = 3$	$(3, 2)$	$-2 \leq x \leq 8$	$0 \leq y$

3. What are the  $x$ - and  $y$ -intercepts for the function  $f(x) = x^2 - 2x - 8$ ?

- a.  $x = -2, x = 4, y = -8$
- b.  $x = -2, x = 2, y = -8$
- c. no  $x$ -intercepts,  $y = -8$
- d.  $x = -4, x = 4, y = -8$

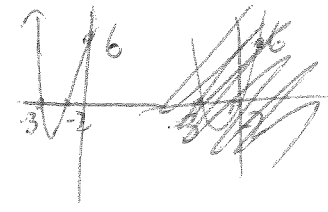
$(x+2)(x-4)$   
 $x = -2, 4$   
 y-int



4. What are the  $x$ - and  $y$ -intercepts for the function  $f(x) = x^2 + 5x + 6$ ?

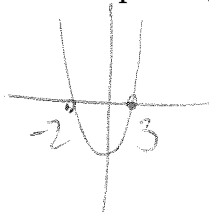
- a.  $x = -4, x = -2, y = 6$
- b. no  $x$ -intercepts,  $y = 6$
- c.  $x = -2.5, y = 6$
- d.  $x = -3, x = -2, y = 6$

$(x+2)(x+3)$   
 $x = -2, -3$   
 y-int



5. Solve  $x^2 - x - 6 = 0$  by graphing the corresponding function and determining the zeros.

- a.  $x = 3, x = 2$
- b.  $x = -3, x = -2$
- c.  $x = 2, x = -3$
- d.  $x = 3, x = -2$

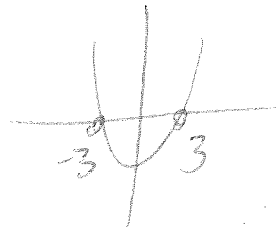


$(x+2)(x-3)$

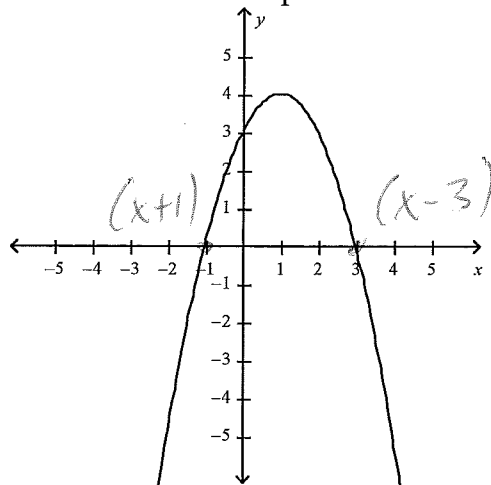
6. Rewrite  $x^2 + 2x = -3x^2 + 2x + 36$  in standard form. Then solve the equation in standard form by graphing.

- a.  $x = 3, x = -3$
- b.  $x = 6, x = -6$
- c.  $x = 3, x = 3$
- d.  $x = 6, x = 6$

$4x^2 - 36 = 0$   
 $x^2 = 9$   
 $x = \pm 3$

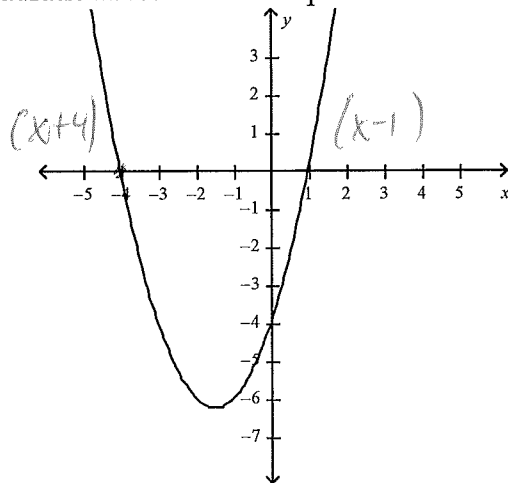


7. What is the correct quadratic function for this parabola?



- a.  $f(x) = (x-1)(x+3)$
- b.  $f(x) = (x+1)(x+3)$
- c.  $f(x) = -(x+1)(x-3)$
- d.  $f(x) = (1-x)(3-x)$

8. What is the correct quadratic function for this parabola?



- a.  $f(x) = (x - 4)(x + 1)$
- b.  $f(x) = (x - 4)(x - 1)$
- c.  $f(x) = (4 - x)(1 - x)$
- d.  $f(x) = (x + 4)(x - 1)$

9. Which set of data is correct for the quadratic relation  $f(x) = -3(x + 2)(x - 3)$ ?

-2 | 3  
|  
|  
0.5

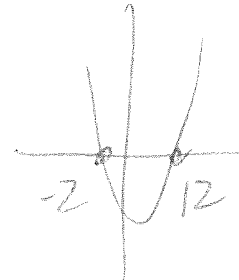
	x-intercepts	y-intercept	Axis of Symmetry	Vertex
A.	(2, 0), (3, 0)	$y = -18$	$x = 2.5$	(2.5, 6.75)
B.	(-2, 0), (3, 0)	$y = -18$	$x = -0.5$	(-0.5, 15.75)
C.	(2, 0), (-3, 0)	$y = 18$	$x = -0.5$	(-0.5, 15.75)
D.	(-2, 0), (3, 0)	$y = 18$	$x = 0.5$	(0.5, 18.75)

- a. Set D. ←
- b. Set B.
- c. Set C.
- d. Set A.

10. Solve  $w^2 - 10w - 24 = 0$  by factoring.

- a.  $w = -8, w = -3$
- b.  $w = -2, w = 12$
- c.  $w = 2, w = -12$
- d.  $w = -6, w = -4$

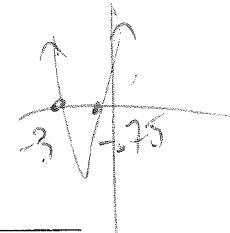
$(w + 2)(w - 12)$   
 $w = -2, 12$



11. Solve  $4p^2 + 15p = -9$  by factoring.

- a.  $p = -\frac{3}{4}, p = 3$
- b.  $p = -\frac{3}{4}, p = -3$
- c.  $p = -4, p = 3$

$4p^2 + 15p + 9 = 0$   
 $(4p + 3)(p + 3) = 0$   
 $p = -\frac{3}{4}, -3$



d.  $p = 4, p = 3$

12. Which set of data is correct for the quadratic relation  $f(x) = 5(x - 27)^2 - 9$ ?

$p = 27$   
 $q = -9$

	Direction parabola opens	Vertex	Axis of Symmetry
<b>A.</b>	upward	$(27, -9)$	$x = 27$
<b>B.</b>	downward	$(-27, 9)$	$x = -27$
<b>C.</b>	upward	$(-27, -9)$	$x = -9$
<b>D.</b>	downward	$(27, 9)$	$x = 9$

13. Which set of data is correct for the quadratic relation  $f(x) = -6(x - 18)^2 - 30$ ?

$p = 18$   
 $q = -30$

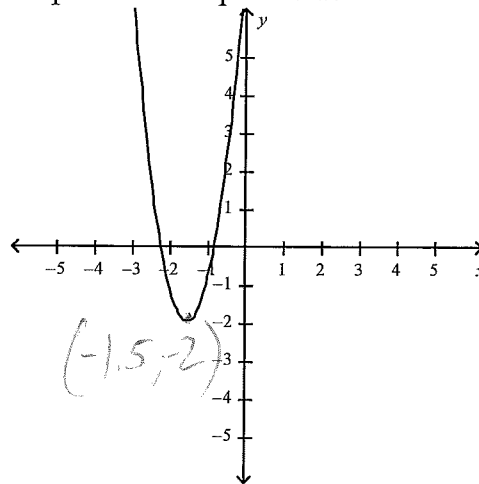
	Direction parabola opens	Vertex	Axis of Symmetry
<b>A.</b>	upward	$(30, -18)$	$x = 30$
<b>B.</b>	downward	$(6, 30)$	$x = -18$
<b>C.</b>	upward	$(-6, -18)$	$x = -30$
<b>D.</b>	downward	$(18, -30)$	$x = 18$

14. Which function has a minimum value?

- a.  $f(x) = -3.2(x - 4.2)^2 + 1.6$
- b.  $f(x) = -3(x - 7.5)^2 - 2.6$
- c.  $f(x) = 0.5(x - 2.2)^2 + 6.1$
- d.  $f(x) = -2(x + 4)^2 + 6$

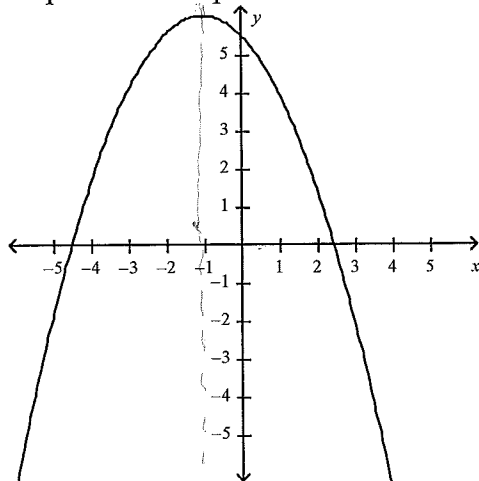
↑  
↑  
↓ ← positive!  
↑

15. Which quadratic function represents this parabola?



- a.  $f(x) = -4(x + 1.5)^2 + 2$
- b.  $f(x) = 4(x - 1.5)^2 - 2$
- c.  $f(x) = 4(x + 1.5)^2 - 2$
- d.  $f(x) = 4(x + 1.5)^2 + 2$

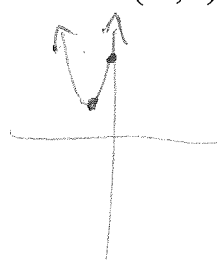
16. Which quadratic function represents this parabola?



- a.  $f(x) = -0.5(x + 1)^2 + 6$
  - b.  $f(x) = 0.5(x + 1)^2 + 6$
  - c.  $f(x) = 0.5(x - 1)^2 - 6$
  - d.  $f(x) = -0.5(x - 1)^2 + 6$
- $p = -1$   
 $q = 6$        $a = -$

17. A quadratic function which has a vertex  $(-1, 3)$  and y intercept 7 is:

- a.  $y = -(x + 1)^2 + 3$
- b.  $y = 4(x + 1)^2 + 3$
- c.  $y = (x - 1)^2 + 3$
- d.  $y = 3(x - 1)^2 + 3$



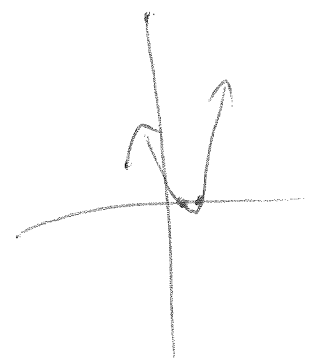
18. Solve  $2y^2 - 3y + 1 = 0$  using the quadratic formula.

- a.  $y = 1, y = -\frac{1}{2}$
- b.  $y = 1, y = \frac{1}{2}$
- c.  $y = -1, y = \frac{1}{2}$
- d.  $y = 1, y = \frac{1}{2}$

$$\frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(1)}}{2(2)}$$

$$\frac{3 \pm \sqrt{1}}{4}$$

$\swarrow$        $\searrow$   
 $\frac{3+1}{4}$        $\frac{3-1}{4}$   
 $1$        $\frac{1}{2}$



**Written Section:**

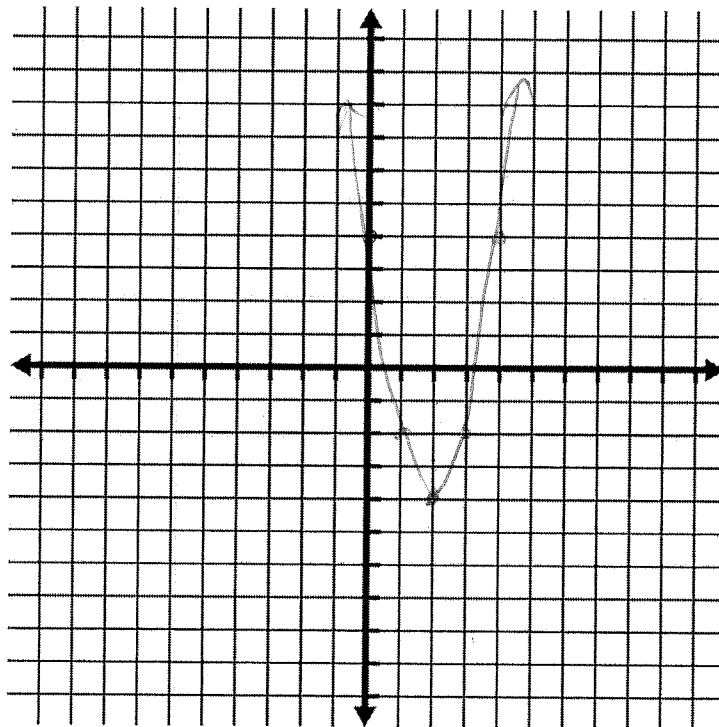
Please show all work

1. Fill in the chart below for the equation  $y = 2(x - 2)^2 - 4$

<b>Horizontal shift (p)</b>	2
<b>Vertical shift (q)</b>	-4
<b>Vertex</b>	(2, -4)
<b>Axis of Symmetry</b>	$x = 2$
<b>Stretch Factor (a)</b>	2
<b>Opens up or down?</b>	up

( /3 marks)

Draw the graph. Use a pattern or your calculator to find at least 5 points.



( /2 marks)

<b>Domain</b>	all reals
<b>Range</b>	$y \geq -4$

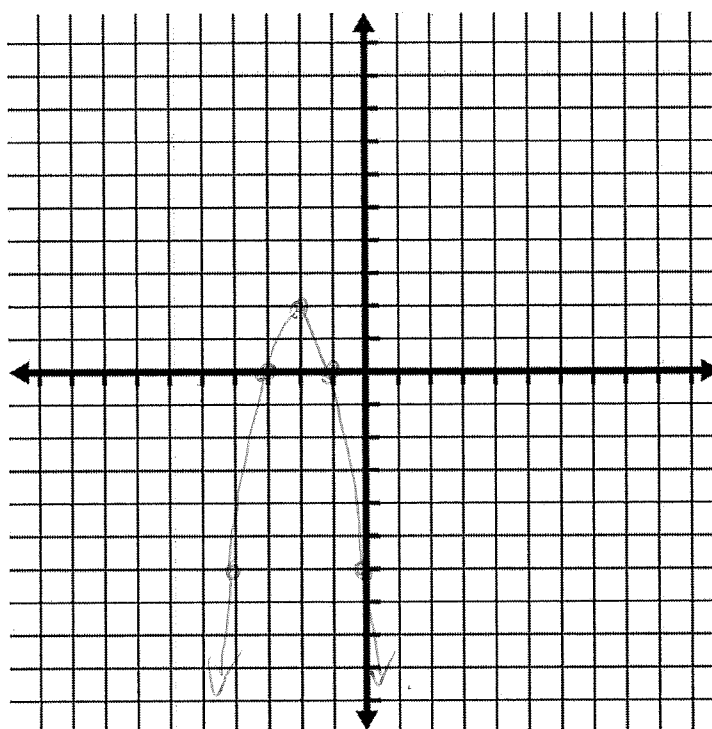
( /1 mark)

2. Fill in the chart below for the equation  $y = -2(x+1)(x+3)$ .

<b>x-intercepts (zeros)</b>	-1, -3
<b>Axis of Symmetry</b>	$x = -2$
<b>Stretch Factor (a)</b>	-2
<b>y-intercept</b>	-6

( /2 marks)

Draw the graph. Use a pattern or your calculator to find at least 5 points.



( /2 marks)

<b>Domain</b>	all reals
<b>Range</b>	$y \leq 2$

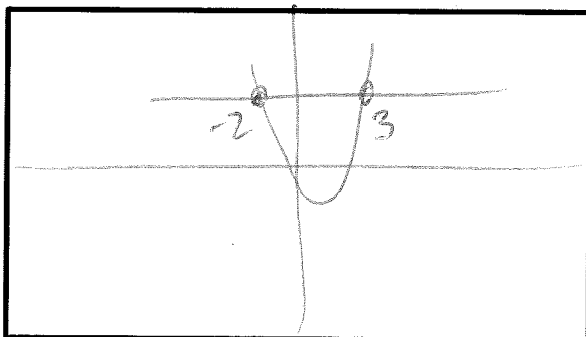
( /1 mark)

3. Use either method to solve  $x^2 - x = 6$  using your graphing calculator.  
Provide a sketch along with your window settings (2 marks)

Method #2.

$$y_1 = x^2 - x$$

$$y_2 = 6$$



$$Xmin = -10$$

$$Xmax = 10$$

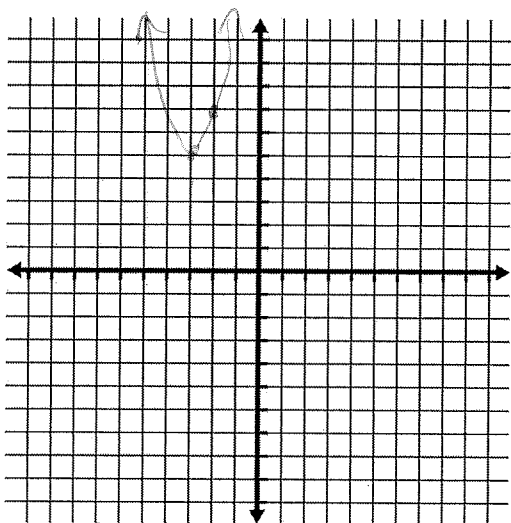
$$Ymin = -10$$

$$Ymax = 10$$

2 Standard

Solution(s): -2, 3

4. Find the equation of the parabola with vertex  $(-3, 5)$  and passing through the point  $(-2, 7)$ . Sketch a graph to support your work. (3 marks)



$$y = a(x - p)^2 + q$$

$$y = a(x + 3)^2 + 5$$

$$7 = a(-2 + 3)^2 + 5$$

$$2 = a(1)$$

$$2 = a$$

$$y = 2(x + 3)^2 + 5$$



5. Solve  $2x^2 + 5x - 3 = 0$

M to -6  
A to 5

<p>By factoring... (2 marks)</p> $(2x - 1)(2x + 6) \div 2$ $(2x - 1)(x + 3) = 0$ $x = \frac{1}{2}, -3$	<p>By formula... (2 marks)</p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-5 \pm \sqrt{5^2 - 4(2)(-3)}}{2(2)}$ $x = \frac{-5 \pm \sqrt{49}}{4}$ $x = \frac{-5 \pm 7}{4}$ <p style="text-align: center;"> <math>\swarrow</math>      <math>\searrow</math>  <math>\frac{1}{2}</math>      <math>-3</math> </p>
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6. Tyler is on top of the Portable roof trying to kick the rugby ball through the posts. The height of the ball,  $y$ , in feet, is modeled by the function  $y = -4.9x^2 + 8x + 12$ , where  $x$  is the time in seconds after the ball is kicked.

a) According to the equation given, how high is the Portable roof? (1 mark)

y-intercept = 12 feet

b) How long does it take for the ball to reach its maximum height? What is this height? (2 marks)

CALC max      8.2 seconds ball is 15.27 ft high

c) How long does it take the ball to hit the ground? (1 mark)

CALC zero      2.58 seconds

Choose **ONE** of the following problems (or do more for BONUS) (3 marks)  
You must create a quadratic equation to model the problem, then find the solution.

7A. The length and width of a rectangular sheet of paper is 8.5x11 inches. How much must be added equally to the length and width to double the area?

$$8.5 \times 11 \times 2 = (8.5 + x)(11 + x)$$

METHOD #2

CALC intersection

$$x = 3.98 \text{ inches}$$

7B. The Abbotsford Heat is considering changing their ticket prices. The current ticket price is \$15 and they sell an average of 2000 tickets. For every dollar increase in price, 80 less people will buy tickets. What price should they set in order to maximize the revenue?

$$R = (2000 - 80x)(15 + x)$$

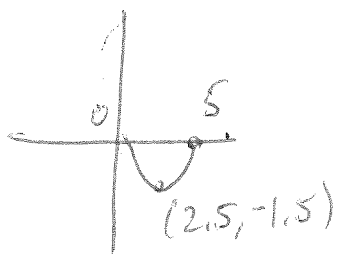
CALC

MAX

$$x = 5$$

Price should be  $15 + 5 = \underline{\underline{\$20}}$

7C. Gail is competing in the National Lifesaving Championship. She dives under an obstacle as she is swimming in his lane. Will observes that Gail's depth underwater over time can be modeled by a quadratic equation. She was underwater for 5 seconds and her maximum depth was 1.5 m. How far underwater is she after 4 seconds?



$$y = a(x)(x-5)$$

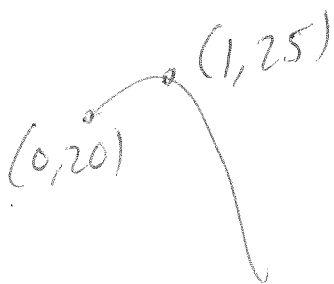
$$-1.5 = a(2.5)(2.5-5)$$

$$.24 = a$$

$$y = .24x(x-5)$$

CALC  
value  $x=4$  . depth is  $-0.96$  meters

7D. Stephen throws a rock off of a bridge from a height of 20m above the water. If the maximum height of the rock is 25m and it occurred exactly 1.0 s after the rock left his hand, then how long in total will it take for the rock to hit the water?



$$y = a(x-1)^2 + 25$$

$$20 = a(0-1)^2 + 25$$

$$-5 = a(1)$$

$$-5 = a$$

$$y = -5(x-1)^2 + 25$$

CALC  
zero

3.23 seconds

**Formulas and Work Page**

Vertex Form:  $y = a(x - p)^2 + q$

Quadratic Formula:  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

