



Name _____ Period _____ Date _____

NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. Graph of a quadratic function
2. Quadratic parent function
3. Vertical translation

Short Answer:

4. Is the equation $y = 2x^2 - 3x + 5$ narrower or wider than the graph of $y = x^2 - 3x + 5$? Explain why.
5. When graphing a quadratic function in standard form, how do you find the vertex of the parabola?

Review:

6. Evaluate the expression $-x^2 - 4x - 4$ when $x = -2$.
7. Identify the type of function shown in the table:

Then, find the function:

x	-1	0	1	2	3
y	4/3	4	12	36	108

8. Factor the polynomial: $144 - 25x^2$

Problems:

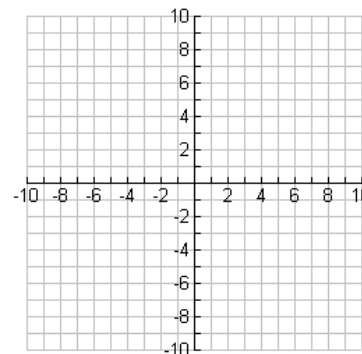
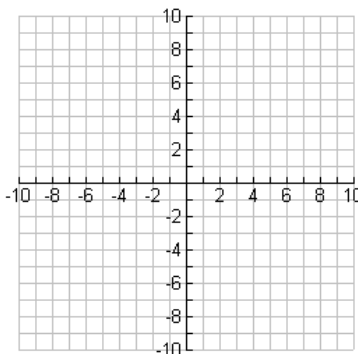
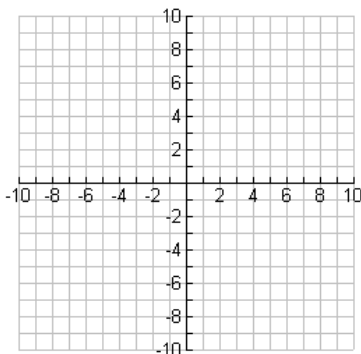
Be sure to show all work used to obtain your answer. Circle or box in the final answer.

9. Graph the quadratic functions. Label the vertex and axis of symmetry on each graph.

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

b. $y = -\frac{1}{2}x^2 + 3$

c. $y = x^2 - 2x - 5$



10. Will the function $y = 2x^2 - 3x + 5$ have a maximum or minimum value? Explain.



11. Use the graphs to answer the following questions.
State the vertex for each parabola:

a. parabola A: _____ b. parabola B: _____

State the y-intercept for each parabola:

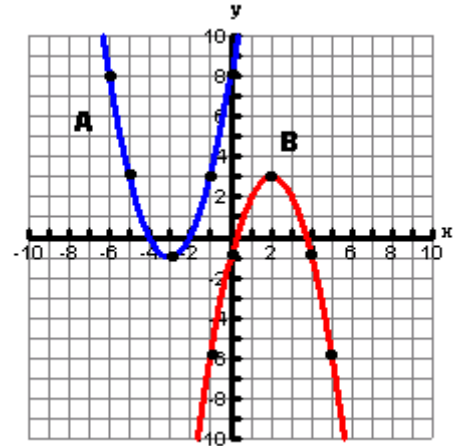
c. parabola A: _____ d. parabola B: _____

e. State the line of symmetry for parabola A. _____

f. Which parabola has a maximum value? _____

Find the equation for each parabola:

g. parabola A: _____ h. parabola B: _____

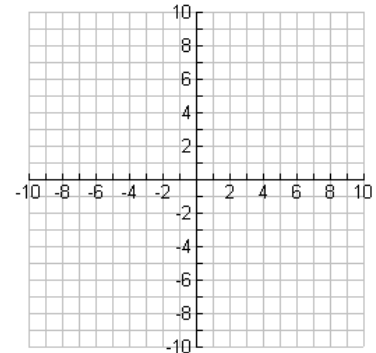
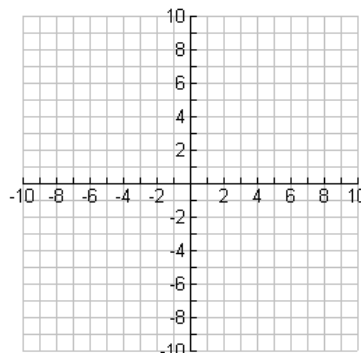
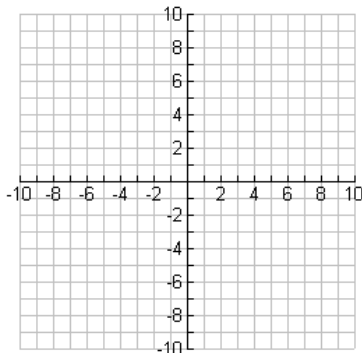


12. Graph the quadratic functions below.

a. $y = -(x-3)(x+2)$

b. $y = 2(x+1)(x+5)$

c. $y = 3(x-4)^2 - 8$

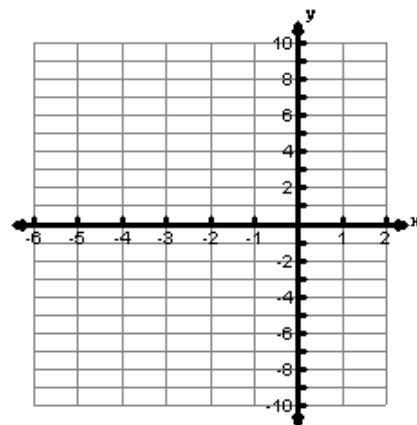


13. Graph the function: $y = -x^2 - 4x + 4$

axis of symmetry: _____

vertex: _____

y-intercept: _____



14. Describe the transformations for the functions below from the parent quadratic function.

a. $g(x) = -4(x-5)^2 + 1$



b. $h(x) = \frac{1}{4}x^2 - 7$

c. $k(x) = 3(x+1)^2 - 6$

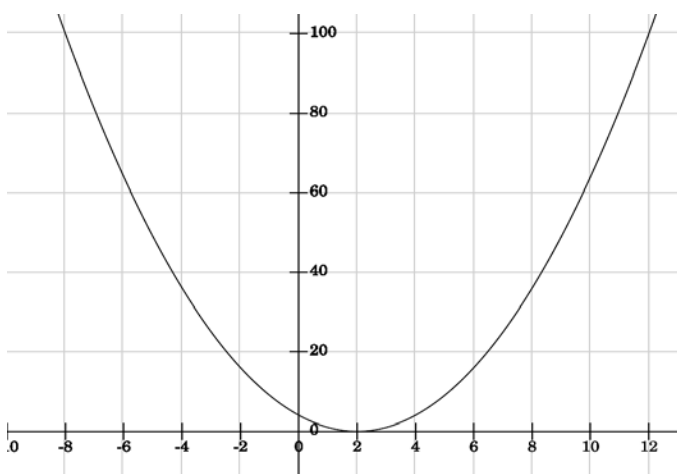
15. The table of values below is for a parabola.

x	-7	-6	-5	-4	-3	-2	-1	0	1	2
y			-12	-13	-12	-9	-4	3	12	23

- a. Fill in the two missing values in the table above.
- b. What are the coordinates of the vertex? _____
- c. What is the parabola's y-intercept? _____
- d. Does the parabola open up or down? _____
- e. Does the parabola have a maximum or minimum value? _____

16. The graph below shows the relationship between hours studying (x) and test score ($f(x)$) for an upcoming math test.

Score on test (%)



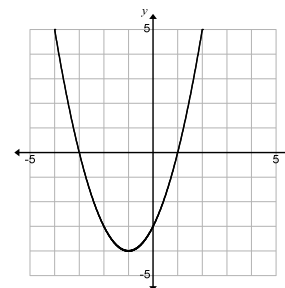
The relationship between hours studied (x) and test score ($f(x)$) can be modeled with the following function for an upcoming history test: $f(x) = (x+1)^2 + 20$. Compare the math and history test functions.

- a) Which graph has the smaller minimum? Show your work.
- b) Which graph has the smaller y-intercept? What is the approximate value?
- c) Compare the slopes of the two functions.

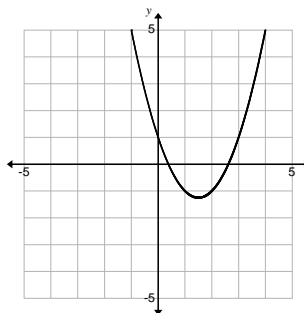


Multiple Choice Section: **Circle the best answer.**

17. Determine the domain and range of the function $y = (x - 1)(x + 3)$ shown in the graph at the right.



- A. Domain: $-3 \leq x \leq 1$; Range: all real numbers
 B. Domain: $-1 \leq x \leq 3$; Range: all real numbers
 C. Domain: all real numbers; Range: $y \leq -4$
 D. Domain: all real numbers; Range: $y \geq -4$
18. Which equation *best* represents the graph at the right?



- A. $y = x^2 - 6x + 2$
 B. $y = -x^2 + 6x - 2$
 C. $y = x^2 - 3x + 1$
 D. $y = -x^2 + 3x - 1$
19. A baseball player throws a ball from the outfield toward home plate. The ball's height above the ground is modeled by the equation $y = -16x^2 + 48x + 6$, where y represents height, in feet, and x represents time, in seconds. The ball is initially thrown from a height of 6 feet. What is the maximum height that the ball reaches?
- A. 76 feet
 B. 54 feet
 C. 48 feet
 D. 42 feet
20. Compared to the graph of $f(x) = x^2$, the graph of $g(x) = 2x^2 - 5$ is
- A. narrower and translated down
 B. narrower and translated up
 C. wider and translated down
 D. wider and translated up



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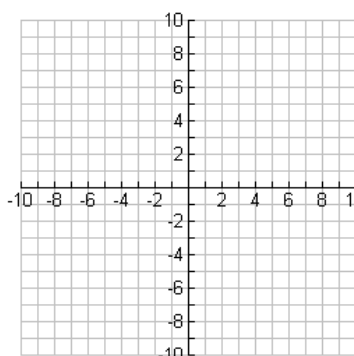
CALCULATOR SECTION

1. A punter kicked a 41-yard punt. The path of the football can be modeled by $y = -0.035x^2 + 1.4x + 1$, where x is the distance (in yards) the football is kicked and y is the height (in yards) the football is kicked. Find the maximum height of the football.

2. Graph the following function in your calculator and then sketch it below. $y = 2.5x^2 - 4x - 3.25$
Round values to the nearest hundredth place.

Find the vertex with your grapher: _____

Find the y-intercept: _____



3. The value of Jennifer’s stock portfolio is given by the function $v(t) = 50 + 73t - 3t^2$, where v is the value of the portfolio in hundreds of dollars and t is the time in months.

- a) How much money did Jennifer start with?
- b) When will the value of Jennifer’s portfolio be at a maximum?
- c) What will that maximum value be equal to?
- d) When will Jennifer’s stock portfolio be worth nothing (0 dollars)?