22 Quadratic Functions

Due:
12/14/2015 at 06:00am EST.

Students will be able to:

- Identify the graph of a quadratic function
- Determine a possible formula for a quadratic function based on the graph
- Find the vertex of parabola
- Bring equation of parabola into vertex form, $a(x-h)^2 + k$
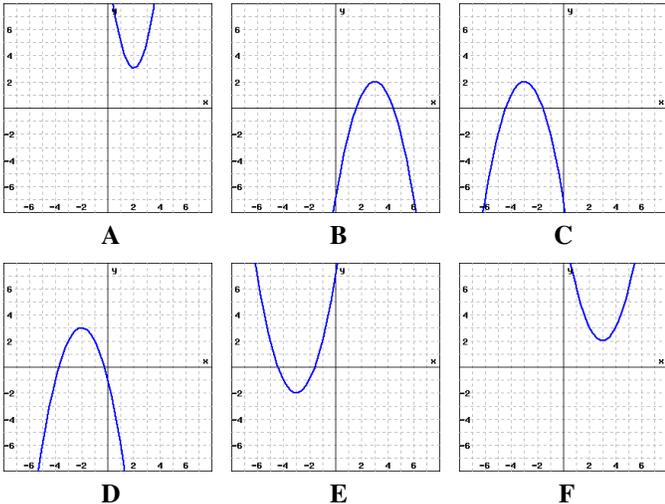- Bring equation of parabola into standard form $ax^2 + bx + c$

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt)

Match the each graph with its corresponding equation.

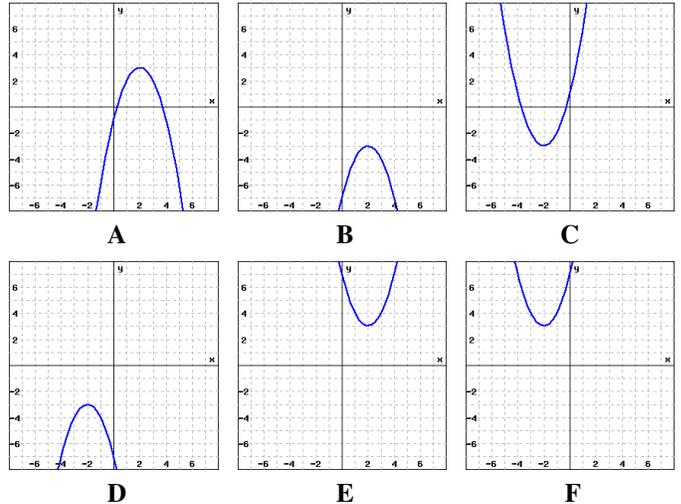| ? | 1. $-(x+2)^2 + 3$ |
?	2. $-(x+3)^2 + 2$
?	3. $2(x-2)^2 + 3$
?	4. $(x+3)^2 - 2$

A   B   C

D   E   F

(Click on a graph to enlarge it)

2. (1 pt)

Match the each graph with its corresponding equation.

?	1. $(x+2)^2 - 3$
?	2. $-(x-2)^2 - 3$
?	3. $-(x+2)^2 - 3$
?	4. $-(x-2)^2 + 3$

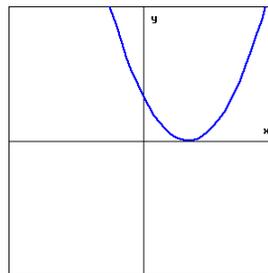A   B   C

D   E   F

(Click on a graph to enlarge it)

3. (1 pt)

The quadratic function in the graph is given by $f(x) = a(x-h)^2 + k$. From the graph, determine whether each constant a, h, and k is positive, negative, or zero.

a is $\boxed{?}$
h is $\boxed{?}$
k is $\boxed{?}$

4. (1 pt) Suppose $f(x) = x^2 - 11x + 18$.

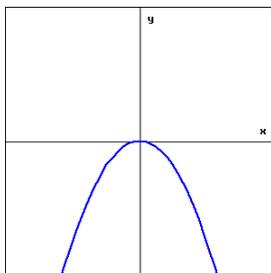(a) For which values of x is the function $f(x)$ positive? Enter your answer using inequalities.

———————

(a) For which values of x is the function $f(x)$ negative? Enter your answer using inequalities.

_____

5. (1 pt)

The quadratic function in the graph is given by $f(x) = a(x-h)^2 + k$. From the graph, determine whether each constant a, h, and k is positive, negative, or zero.

a is [?]
h is [?]
k is [?]

6. (1 pt)

The quadratic function in the graph is given by $f(x) = a(x-h)^2 + k$. From the graph, determine whether each constant a, h, and k is positive, negative, or zero.
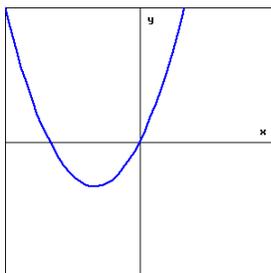
a is [?]
h is [?]
k is [?]

7. (1 pt) Find the minimum and maximum value of the function $y = -(x-3)^2 + 9$. Enter *infinity* or *-infinity* if the function never stops increasing or decreasing.
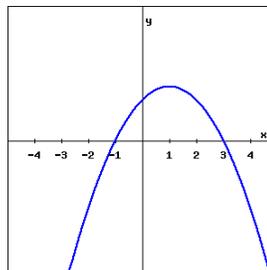
Maximum value = _____

Minimum value = _____

8. (1 pt)

Find a possible formula for the quadratic function in the graph.

$f(x) =$ _____

9. (1 pt) The quadratic expression $(x-3)^2 - 25$ is written in vertex form.

(a) Write the expression in standard form $ax^2 + bx + c$.

_____

(b) Write the expression in factored form $k(ax+b)(cx+d)$.

_____

(c) Evaluate the expression at $x = 0$ using each of the three forms, compare the results, and enter your answer below.

_____

(d) Evaluate the expression at $x = 5$ using each of the three forms, compare the results, and enter your answer below.

_____

10. (1 pt) Find the vertex of the parabola $y = 4x + 7 - x^2$. Enter your answer as a point (h, k), including the parentheses.

The vertex is at the point _____

11. (1 pt) Put the function $y = \dfrac{(x+8)^2}{3} - 6$ in vertex form $f(x) = a(x-h)^2 + k$ and determine the values of a, h, and k.

$a =$ _____

$h =$ _____

$k =$ _____