Name: _____ Hour: _____ Date: _____

# Comparing Features of Quadratic Functions

| Feature | Definition/Meaning | How to Identify |
|---|---|---|
| Y-Intercept | | |
| Axis of Symmetry | | |
| Vertex | | |
| Concavity | | |
| X-Intercept(s) | | |

**Example 1:**

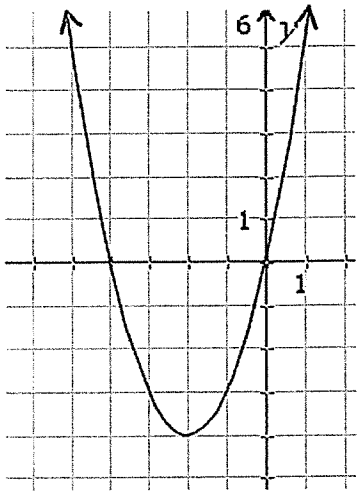
$f(x) = x^2 + 2x - 8$

Concavity: Min or Max?

Axis of Symmetry: Vertex:

y-intercept: x-intercept(s):

The function g(x) is defined by the following graph:




Concavity:

Min or Max?

Axis of Symmetry:

Vertex:

y-intercept:

x-intercept(s):

*Example continued on next page:*

a) Do the functions have the same concavity?

c) Which function has a greater y-intercept?

b) Which function has a lower minimum?

d) How many roots do the functions have in common?

**Example 2:**

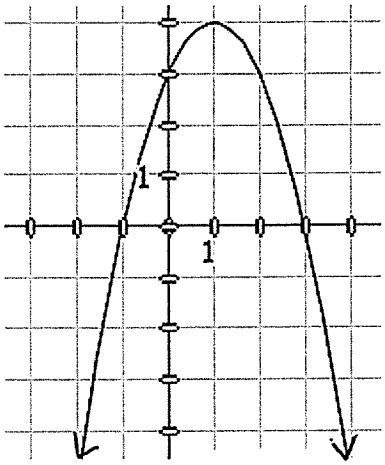
$f(x) = 2x^2 + 4x + 6$ (minus)

Concavity: Min or Max?

Axis of Symmetry: Vertex:

y-intercept: x-intercept(s):

The function g(x) is defined by the following graph:




Concavity:

Min or Max?

Axis of Symmetry:

Vertex:

y-intercept:

x-intercept(s):

a) Do the functions have the same concavity?

c) Which function has a lower y-intercept?

b) Which function has a greater maximum?

d) What solutions do the functions have in common?

**Example 3:**

$f(x) = x^2 + 6x - 7$

Concavity: Min or Max?

Axis of Symmetry: Vertex:

y-intercept: x-intercept(s):

The following table gives *some* of the points for the function $g(x)$.

| X | Y |
|---|---|
| -8 | -6 |
| -7 | 0 |
| -4 | 8 |
| -1 | 0 |
| 0 | -6 |

Concavity: Min or Max?

Axis of Symmetry: Vertex:

y-intercept: x-intercept(s):

*Example continued on the next page:*

a) Do the functions have the same concavity?

b) What kind of *a* value must *g(x)* have?

c) Which function has a greater y-intercept?

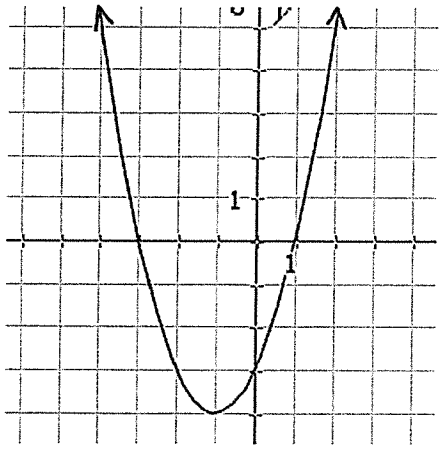
d) How many zeros do the functions have in common?

**PRACTICE:**

1) Use the following representations to answer parts (a) – (c).

$f(x) = 2x^2 - 8x + 6$

$g(x)$ can be represented by the following graph:



The following table contains some of the points for the function $h(x)$.

| X | Y |
|---|---|
| -7 | 5 |
| -6 | 0 |
| -5 | -3 |
| -4 | -4 |
| -3 | -3 |
| -2 | 0 |
| -1 | 5 |
| 0 | 12 |
| 1 | 21 |

(a) Find the vertex of each representation

$f(x)$:

$g(x)$:

$h(x)$:

(b) Classify each vertex as either a max or a min.

$f(x)$:

$g(x)$:

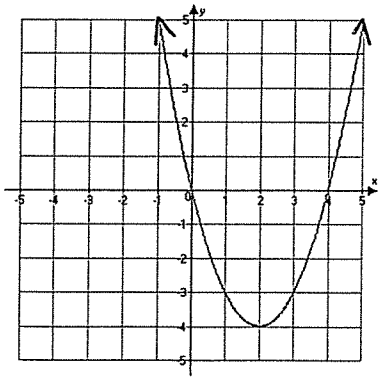
$h(x)$:

(c) Which function has the least (smallest) min?

1) Use the following representations to answer parts (a) – (c).

$f(x) = -x^2 + 12x - 28$

$g(x)$ can be represented by the following graph:



The following table contains some of the points for the function $h(x)$.

| x | y |
|---|---|
| -2 | 5 |
| -1 | 0 |
| 0 | -3 |
| 1 | -4 |
| 2 | -3 |
| 3 | 0 |
| 4 | 5 |

(a) Find the y-intercept of each representation

$f(x)$:

$g(x)$:

$h(x)$:

(b) Classify each vertex as either a max or a min.

$f(x)$:

$g(x)$:

$h(x)$:

(c) Which function has the lowest y-intercept? Explain how you are able to come to that conclusion.

SLOT Practice

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**Simplify each radical.**

1) $\sqrt{16}$

2) $\sqrt{50}$

3) $\sqrt{64}$

4) $\sqrt{32}$

**Solve each equation with the quadratic formula.**

5) $2n^2 + 5n + 2 = 0$

6) $2a^2 + a - 3 = 0$

7) $p^2 + 2p - 1 = 0$

8) $2a^2 + 2a - 5 = 0$