Unit 8, Lesson 23

# Comparing Functions

Let's evaluate and compare functions.

## 23.1 Worked Example: Vertex Form

Write the function $f(x) = x^2 + 2x - 8$ in vertex form. Then, write the coordinates of the vertex.

Step 1:

$$b = 2, \text{ so } (\tfrac{b}{2})^2 = 1.$$

Step 2:

$$f(x) = x^2 + 2x + 1 - 8 - 1$$

Step 3:

$$f(x) = (x + 1)^2 - 9$$

Step 4:

The vertex is $(-1, -9)$.

## 23.2 Finding the Vertex

Write each function in vertex form, then find the coordinates of the vertex.

1. $y = x^2 - 4x + 7$

2. $y = (x - 1)(x + 3)$

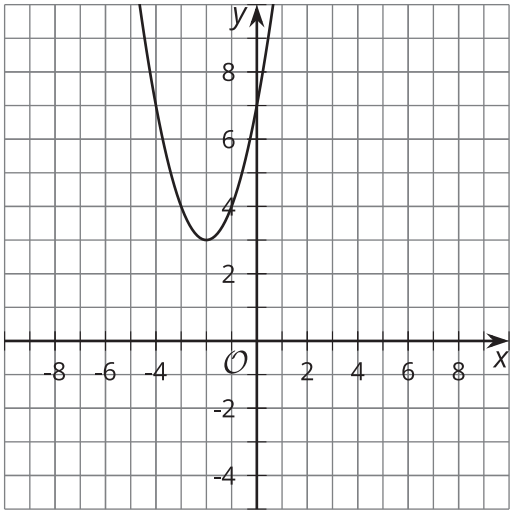
3. $y = (x - 2)(x + 2)$

4. $y = x^2 - 2x + 1$

5. $y = -x^2 - 2x - 6$

6. $y = 2x^2 - 12x + 22$

7.



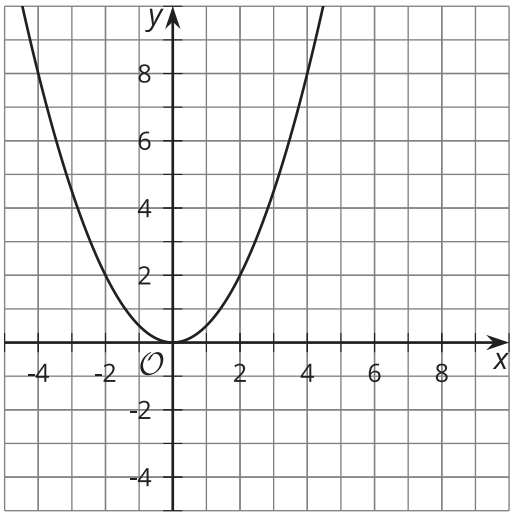
# 23.3 Comparing Functions

The notation $f(2)$ means the output of function $f$ when $x$ is 2. For each function, decide whether $f(2) > f(3)$, $f(2) < f(3)$, or $f(2) = f(3)$.

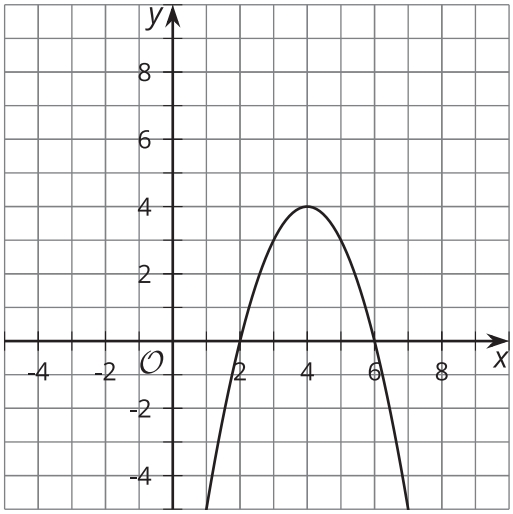
1. $f(x) = x^2 + 2x + 3$

2. $f(x) = (x - 2)(x - 3)$

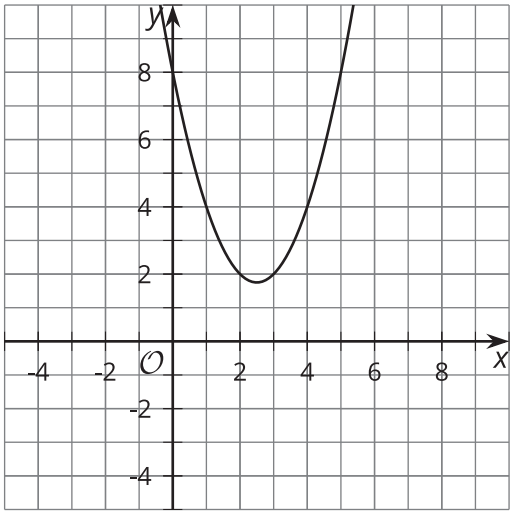
3. $f(x) = -x^2 + 5$

4. 

5.




6.




7.

