Chapter 2.2 Check Your Understanding

Exercises 1–6 True or False. Give reasons.

1. The graph of a function cannot have more than one y-intercept point.

Answer:

True; the definition of a function requires that for every x in the domain, there is exactly one value of y.

2. The graph of $y = \dfrac{x}{|x|}$ is identical to the graph of $y = \dfrac{|x|}{x}$.

Answer:

True; if $x > 0$, then $\frac{x}{|x|} = \frac{x}{x} = 1$ and $\frac{|x|}{x} = \frac{x}{x} = 1$. If $x < 0$, then $\frac{x}{|x|} = \frac{x}{-x} = -1$ and $\frac{|x|}{x} = \frac{-x}{x} = -1$. Therefore $\frac{x}{|x|} = \frac{|x|}{x}$ for every nonzero value of x.

3. For the greatest integer function $f(x) = Int(x)$,
(a) $f(-2.5) = -f(2.5)$ **(b)** $f(-3) = -f(3)$.

Answer:

(a) False; $f(-2.5) = [-2.5] = -3$ and $-f(2.5) = -[2.5] = -2$.
(b) True; $f(-3) = [-3] = -3$ and $-f(3) = -[3] = -3$.

4. The distance between the x- and y-intercept points of the graph of $y = 1 - x$ is $\sqrt{2}$.

Answer:

True; the intercept points are A(0, 1) and B(1, 0); $d(A, B) = \sqrt{1^2 + 1^2} = \sqrt{2}$.

5. For any function f, the function $g(x) = f(x^2)$ is an even function.

Answer:

True; since $g(-x) = f((-x)^2) = f(x^2) = g(x)$.

6. For any even function f, if $(-2, 4)$ is on the graph of f, then $(-2, -4)$ must also be on the graph of f.

Answer:

False; if $(-2, 4)$ is on the graph of an even function, all we can conclude is that $(2, 4)$ is also on the graph.

Exercises 7–10 Fill in the blank so that the following statement is true. "If you draw a graph of function f using [-10, 10] × [-10, 10], then the number of x-intercept points shown in the display is _____."

7. $f(x) = 0.3x^2 - 4x - 5$

Answer:

One

8. $f(x) = 0.5x^2 + 4x + 4$

Answer:

Two

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

Answer:

Two

10. $f(x) = 3|x - 6| - 2|x - 1|$

Answer:

One