Practice 2.1.4: Function Notation and Evaluating Functions

Evaluate the given functions and determine the range of each.

1. Evaluate $f(x) = 2x - 8$ over the domain {0, 1, 3, 8}. What is the range of $f(x)$?

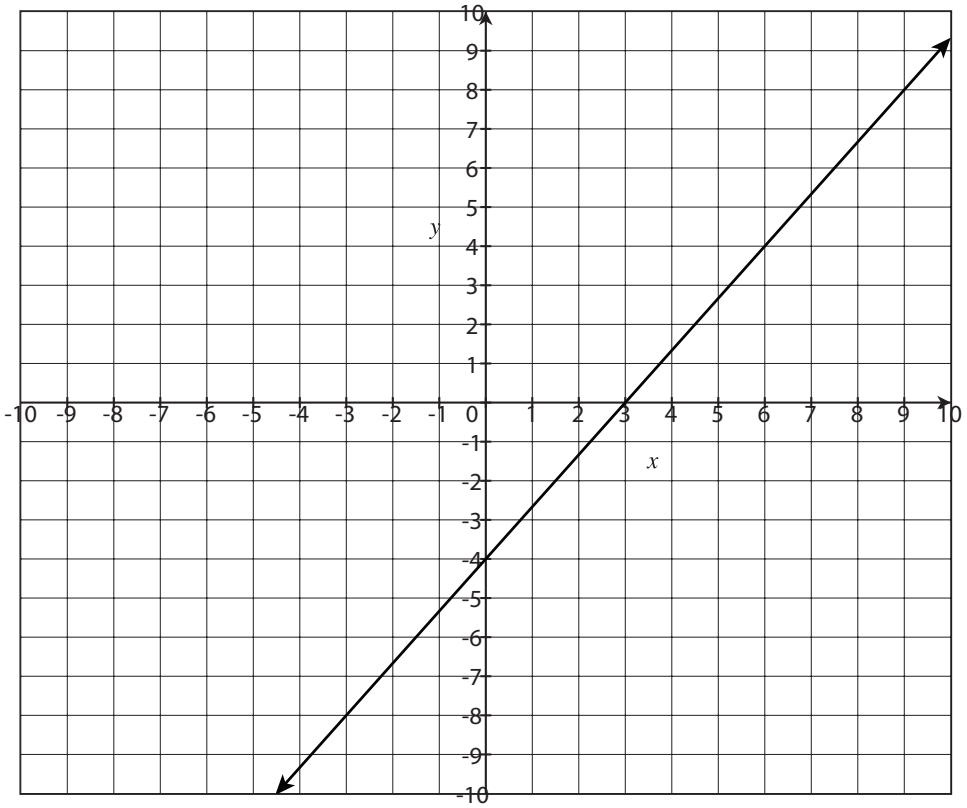
2. Evaluate $g(x) = x - 13$ over the domain {2, 4, 6, 8}. What is the range of $g(x)$?

3. Evaluate $f(x) = 3^x + 1$ over the domain {1, 2, 3, 4}. What is the range of $f(x)$?

4. Given $r(x) = 2^x - 1$, evaluate r over the domain {0, 1, 2, 3}. What is the range of $r(x)$?

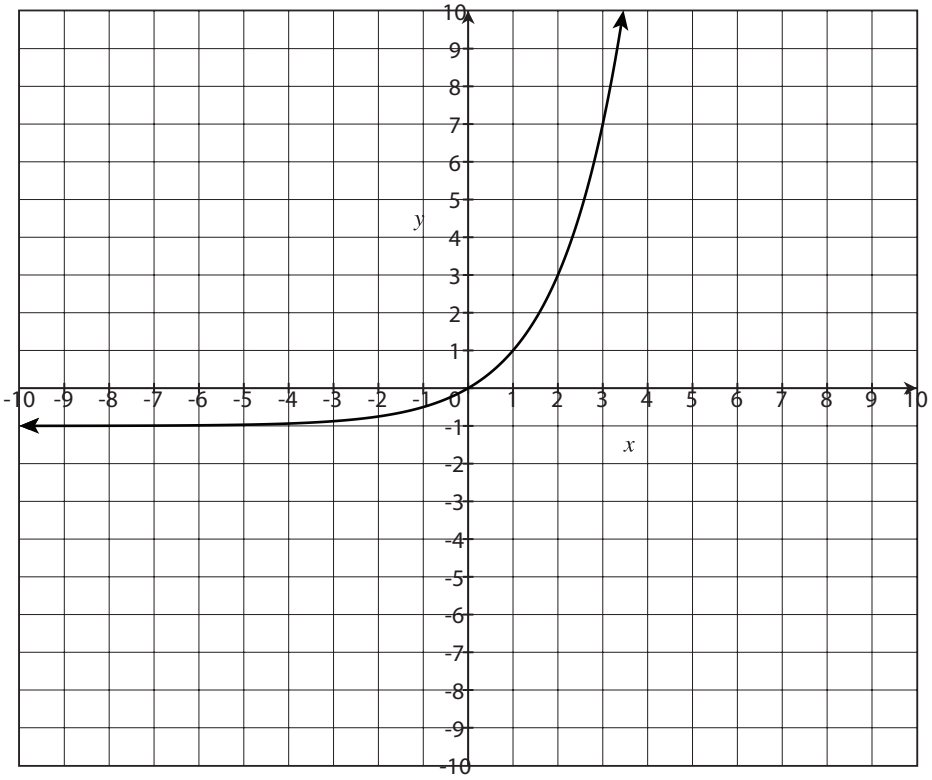
Use what you know about function notation and graphing functions to complete problems 5–10.

5. Given the graph of $f(x)$ below, what is $f(-3)$?



continued

6. Given the graph of $f(x)$ below, what is $f(2)$?



7. A growing company has been hiring employees at a steady rate of 1 new hire per month. The company started with 2 employees. The growth of the company can be modeled with the function $g(x) = x + 2$, where x is in months. Evaluate the function over the domain {3, 6, 18, 24}. Interpret the results and use a graph to explain your answer.

8. A population of insects doubles every 3 days. The population started with 8 insects. The function that models this growth is $f(x) = 8(2)^{\frac{x}{3}}$. Evaluate the function over the domain {0, 3, 6, 12}.

   Interpret the results and use a graph to explain your answer.

9. A postal delivery service charges $3.40 per package and then an additional $0.50 per ounce the package weighs. The function can be modeled by $f(x) = 0.5x + 3.4$. Tom ships 4 packages with the following weights: 2 ounces, 3.5 ounces, 15 ounces, and 21.3 ounces. Write four statements using function notation that evaluate the function given each of these weights. Interpret the results in terms of the context of the function.

10. An investment promises a return of 12% per year. Brody wants to figure out how much money he will have if he invests $1,000 for 5, 10, or 15 years. The investment's growth can be modeled using the function $f(x) = 1000(1.12)^x$. Write three statements using function notation that evaluate the function given each time frame Brody wants to know about. Interpret the results in terms of the context of the function.