Name _____   Date _____

Challenge Practice
For use with the lesson "Graph Linear Functions"

1. If $f(x) = 2x + 5$ and $g(x) = 3x$, then what is a rule for $f(g(x))$? What is a rule for $g(f(x))$?

2. If $f(x) = x - 7$ and $g(x) = 2x + 1$, then what is a rule for $f(g(x))$? What is a rule for $g(f(x))$?

3. If $f(x) = 5x - 2$ and $g(x) = 4x - 5$, then what is a rule for $f(g(x))$? What is a rule for $g(f(x))$?

4. If $f(x) = 4x - 1$ and $g(x) = -3x + 1$, then what is a rule for $f(g(x))$? What is a rule for $g(f(x))$?

5. If $f(x) = 4x$ and $g(x) = 5x + 1$, then what is a rule for $f(2g(x))$? What is a rule for $g(f(x) + 1)$?

In Exercises 6–8, use the following information.

In the year 1950 the world population was estimated to be 2.50 billion people. In the year 2000 the world population was estimated to be 6.10 billion people.

6. Find the rate of change in world population per year.

7. Write a linear function to model the world population y in the year t after year 1950.

8. Use the linear function from Exercise 7 to estimate the year in which the world population was 3.58 billion people.

In Exercises 9–11, use the following information.

In the year 1000, the United Nations estimates the world population was 300 million people. In the year 1500, the United Nations estimates the world population was estimated to be 500 million people.

9. Find the rate of change in world population per year.

10. Write a linear function to model the world population y in the year t after year 1000.

11. Use the linear function from Exercise 10 to estimate the year in which the world population was 450 million people.