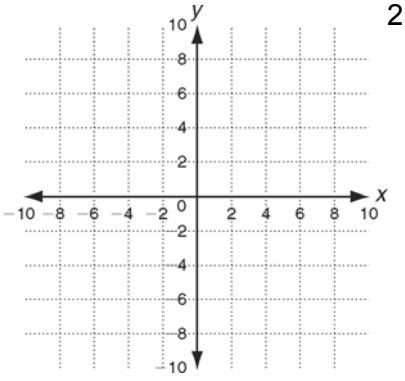
Name _____ Date _____ Class _____

LESSON 1-3

Practice C

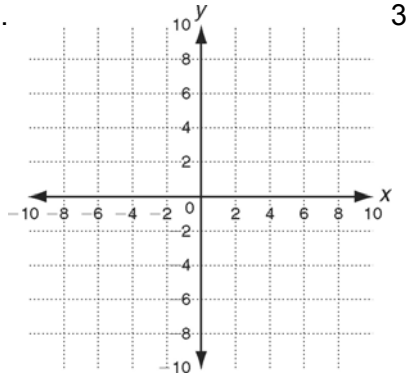
Transforming Linear Functions

Graph $f(x)$. Write the rule for $gf(x)$, using the transformation given, and then graph $g(x)$.

1. 

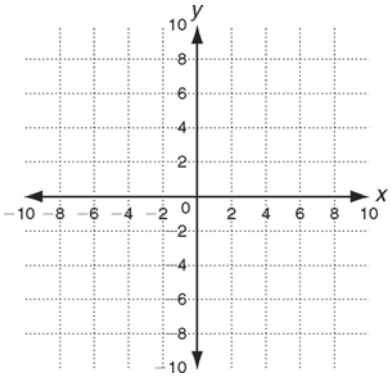
$f(x) = 3x$

horizontal translation left 3 units

2. 

$f(x) = -x - 5$

vertical compression by a factor of $\frac{1}{5}$

3. 

$f(x) = \frac{x}{3} + 2$

reflection across the x-axis

Solve.

4. The rate of increase in a certain city's population in 2000 was 1.4%. The rate in 2001 was 1.9%.
   a. Write a function to represent the increase in population in 2000. _____
   b. Write a function to represent the increase in population in 2001. _____
   c. Describe the transformation that can be applied to the first function to get the second function.

   _____
   d. Find the difference between the two possible growth rates if the population in 2030 is 8.5 billion. _____
5. Let $g(x)$ be the reflection of $f(x)$ across the x-axis. Let $h(x) = x - 1$ be the reflection of $g(x)$ across the y-axis.
   a. Find the rule for $g(x)$. _____
   b. Find the rule for $f(x)$. _____
   c. Graph all three functions on a graphing calculator. Describe the transformation from $f(x)$ to $h(x)$.

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