Name _____ Date _____

1.2 Enrichment and Extension

Transformations of Linear and Absolute Value Functions

In Exercises 1–6, write a function *g* whose graph represents the indicated transformations of the graph of $f(x) = 2x - 1$. Then find the *x*-intercept of the graph of *g*. Use technology to check your answers.

1. translation 3 units right followed by a translation 1 unit down
2. translation 1 unit left followed by a reflection in the x-axis
3. vertical stretch by a factor of 3 followed by a translation 3 units down
4. horizontal shrink by a factor of $\frac{1}{3}$ followed by a translation 5 units up
5. translation 3 units right followed by a vertical stretch by a factor of 2
6. translation 1 unit up followed by a reflection in the x-axis and a translation 3 units left

In Exercises 7–12, write a function *g* whose graph represents the indicated transformations of the graph of $f(x) = |x + 2| - 1$. Then find the *x*-intercept(s) of the graph of *g*. Use technology to check your answers.

7. translation 3 units right followed by a translation 1 unit down
8. translation 1 unit left followed by a translation 2 units up
9. translation 1 unit up followed by a reflection in the x-axis and a translation 3 units left
10. translation 1 unit right followed by a vertical stretch by a factor of 2 and a translation 4 units down
11. horizontal shrink by a factor of $\frac{1}{4}$ followed by a translation 10 units right and 1 unit up, and a reflection in the x-axis
12. translation 5 units right followed by a translation 3 units down, a vertical shrink by a factor of $\frac{1}{2}$, and a reflection in the x-axis

Name _____ Date _____

1.2 Puzzle Time

Why Did The Computer Sneeze?

Write the letter of each answer in the box containing the exercise number.

Write a function *g* whose graph represents the indicated transformation of the graph of *f*.

1. $f(x) = x + 4$; translation 3 units left
2. $f(x) = x - 7$; translation 5 units right
3. $f(x) = |2x - 5| + 3$; translation 2 units up
4. $f(x) = -4x - 8$; reflection in the x-axis
5. $f(x) = |2x + 1| - 6$; reflection in the y-axis
6. $f(x) = -x + 5$; horizontal shrink by a factor of $\frac{1}{2}$
7. $f(x) = |2x - 4|$; vertical stretch by a factor of 4

Write a function *g* whose graph represents the indicated transformations of the graph of *f*.

8. $f(x) = x$; vertical stretch by a factor of 3 followed by a translation 2 units down
9. $f(x) = x$; translation 1 unit up followed by a vertical shrink by a factor of $\frac{1}{4}$
10. $f(x) = |x|$; reflection in the x-axis followed by a translation 2 units right
11. $f(x) = |x|$; vertical shrink by a factor of $\frac{1}{2}$ followed by a translation 5 units up and 1 unit left

Answers

R. $g(x) = \frac{1}{4}x + \frac{1}{4}$

U. $g(x) = -|x - 2|$

T. $g(x) = x - 12$

H. $g(x) = |2x - 5| + 5$

A. $g(x) = -2x + 5$

A. $g(x) = 4x + 8$

S. $g(x) = \frac{1}{2}|x + 1| + 5$

D. $g(x) = |-2x + 1| - 6$

I. $g(x) = 3x - 2$

I. $g(x) = x + 7$

V. $g(x) = 4|2x - 4|$

1	2		3	4	5		6		7	8	9	10	11