1.3 Transformation of Non-Parent Functions Practice A

In Exercises 1–4, write a function $g$ whose graph represents the indicated transformation of the graph of $f$. Use a graphing calculator to check your answer.

1. $f(x) = |x - 2|$; translation 5 units left
2. $f(x) = |x| + 2$; translation 4 units right
3. $f(x) = |3x + 2| + 4$; translation 3 units down
4. $f(x) = |4x - 5|$; translation 3 units up

In Exercises 5–8, write a function $g$ whose graph represents the indicated transformation of the graph of $f$. Use a graphing calculator to check your answer.

5. $f(x) = -3|x| + 7$; reflection in the x-axis
6. $f(x) = \frac{1}{3}x - 2$; reflection in the x-axis
7. $f(x) = |4x| - 6$; reflection in the y-axis
8. $f(x) = |3x - 5| + 3$; reflection in the y-axis

In Exercises 9–12, write a function $g$ whose graph represents the indicated transformation of the graph of $f$. Use a graphing calculator to check your answer.

9. $f(x) = |x| + 3$; vertical stretch by a factor of 4
10. $f(x) = |4x + 3|$; vertical shrink by a factor of $\frac{1}{3}$
11. $f(x) = |3x| + 2$; horizontal shrink by a factor of $\frac{1}{3}$
12. $f(x) = |x + 1|$; horizontal stretch by a factor of 3

In Exercises 13 and 14, write a function $g$ whose graph represents the indicated transformation of the graph of $f$.

13. $f(x) = |x| - 5$; vertical shrink by a factor of $\frac{1}{3}$ followed by a translation 4 units down
14. $f(x) = |2x|$; translation 3 units left followed by a horizontal shrink by a factor of $\frac{1}{2}$
1.3 Transformation of Non-Parent Functions Practice B

In Exercises 1–4, write a function \( g \) whose graph represents the indicated transformation of the graph of \( f \). Use a graphing calculator to check your answer.

1. \( f(x) = |5x| - 2 \); translation 5 units right
2. \( f(x) = |3x + 6| \); translation 4 units up
3. \( f(x) = 3 - |x - 2| \); translation 2 units left
4. \( f(x) = |2x| + 3 \); translation 2 units down

In Exercises 5–8, write a function \( g \) whose graph represents the indicated transformation of the graph of \( f \). Use a graphing calculator to check your answer.

5. \( f(x) = -|x + 3| \); reflection in the \( y \)-axis
6. \( f(x) = \left|\frac{2}{3}x - 4\right| \); reflection in the \( x \)-axis
7. \( f(x) = -5 + |x - 8| \); reflection in the \( y \)-axis
8. \( f(x) = |4x - 1| + 2 \); reflection in the \( y \)-axis

In Exercises 9–12, write a function \( g \) whose graph represents the indicated transformation of the graph of \( f \). Use a graphing calculator to check your answer.

9. \( f(x) = |3 - x| \); horizontal stretch by a factor of 2
10. \( f(x) = 3|x| + 5 \); vertical shrink by a factor of \( \frac{1}{3} \)
11. \( f(x) = |3x| + 2 \); horizontal shrink by a factor of \( \frac{1}{3} \)
12. \( f(x) = -2|x - 2| + 4 \); vertical stretch by a factor of 2

In Exercises 13 and 14, write a function \( g \) whose graph represents the indicated transformation of the graph of \( f \).

13. \( f(x) = |x + 1| \); translation 5 units up followed by a vertical shrink by a factor of \( \frac{1}{4} \)
14. \( f(x) = 2|x| - 2 \); reflection in the \( x \)-axis followed by a translation 2 units left