

QUIZ REVIEW TRANSFORMATION AND ABSOLUTE VALUE

SECTION A

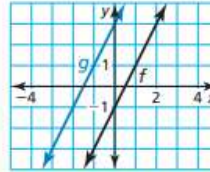
1.1 Parent Functions and Transformations (pp. 3–10)

Learning Target: Graph and describe transformations of functions.

Graph the function and its parent function. Then describe the transformation.

1. $f(x) = x + 3$ 2. $g(x) = |x| - 1$
3. $h(x) = \frac{1}{2}x^2$ 4. $g(x) = -3(x + 3)^2$

5. The graphs of f and g are shown. Describe two different transformations from the graph of f to the graph of g .



6. A function g is a translation 4 units right and 6 units down, followed by a reflection in the y -axis of the graph of $f(x) = -\frac{1}{2}(x + 1)^2$. Graph f and g .

7. The table shows the total distance traveled by a space probe after x seconds. What type of function can you use to model the data? Estimate the distance traveled by the space probe after 1 minute.

Time (seconds), x	0	8	20	36	50
Distance (miles), y	0	76	190	342	475

Vocabulary

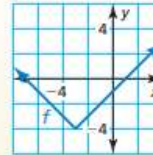
parent function
transformation
translation
reflection
vertical stretch
vertical shrink

1.2 Transformations of Linear and Absolute Value Functions (pp. 11–20)

Learning Target: Understand transformations of linear and absolute value functions.

Write a function g whose graph represents the indicated transformations of the graph of f . Use technology to check your answer.

8. $f(x) = -3x + 4$; translation 3 units down and a reflection in the y -axis
9. $f(x) = |x + 1| - 2$ vertical shrink by a factor of $\frac{1}{2}$ followed by a translation 2 units up
10. The graph of f is shown. Graph g when $g(x) = f(x) + 5$.



11. The total cost of an annual pass for admission to a national park plus camping for x days can be modeled by the function $f(x) = 20x + 80$. A senior citizen pays \$20 less than half of this price for x days. What is the total cost for a senior citizen to go camping for three days in the park?



1.5 Absolute Value Functions (pp. 37–42)

Learning Target: Understand characteristics of absolute value functions.

Graph f . Determine when the function is positive, negative, increasing, or decreasing. Then describe the end behavior of the function.

24. $f(x) = |x + 4| + 7$
25. $y = -|x - 8| + 15$
26. $y = -3|x - 3| + 6$

Graph the absolute value function f with the given characteristics.

27. f has a range of $(2, \infty)$, and a graph that is symmetric about the line $x = 5$, and has a y -intercept of 7.
28. f is increasing over the interval $(-\infty, -3)$ and decreasing over the interval $(-3, \infty)$. The graph of f has a y -intercept of -7 , and the range of f is $(-\infty, -3)$.
29. Graph the absolute value function $f(x) = \frac{1}{4}|x + 6| - 2$. Then find the area of the enclosed region created by the graph of the function and the x -axis.

Vocabulary

vertex form

QUIZ REVIEW TRANSFORMATION AND ABSOLUTE VALUE

Absolute Value Equations Use the definition of absolute value to solve equations containing absolute value expressions.

SECTION B

For any real numbers a and b , where $b \geq 0$, if $|a| = b$ then $a = b$ or $a = -b$.

Always check your answers by substituting them into the original equation. Sometimes computed solutions are not actual solutions.

*Example***Solve $|2x - 3| = 17$. Check your solutions.****Case 1**

$a = b$

$2x - 3 = 17$

$2x - 3 + 3 = 17 + 3$

$2x = 20$

$x = 10$

CHECK

$|2x - 3| = 17$

$|2(10) - 3| = 17$

$|20 - 3| = 17$

$|17| = 17$

$17 = 17 \checkmark$

Case 2

$a = -b$

$2x - 3 = -17$

$2x - 3 + 3 = -17 + 3$

$2x = -14$

$x = -7$

CHECK

$|2(-7) - 3| = 17$

$|-14 - 3| = 17$

$|-17| = 17$

$17 = 17 \checkmark$

There are two solutions, 10 and -7 .

Exercises

Solve each equation. Check your solutions.

1. $|x + 15| = 37$

2. $|t - 4| - 5 = 0$

3. $|x - 5| = 45$

4. $|m + 3| = 12 - 2m$

5. $|5b + 9| + 16 = 2$

6. $|15 - 2k| = 45$

7. $5n + 24 = |8 - 3n|$

8. $|8 + 5a| = 14 - a$

9. $\frac{1}{3}|4p - 11| = p + 4$

10. $|3x - 1| = 2x + 11$

11. $\left|\frac{1}{3}x + 3\right| = -1$

12. $40 - 4x = 2|3x - 10|$

13. $5f - |3f + 4| = 20$

14. $|4b + 3| = 15 - 2b$

15. $\frac{1}{2}|6 - 2x| = 3x + 1$

16. $|16 - 3x| = 4x - 12$