



Algebra 1

Topic: Transformations of Graphs of Linear Functions

Instructions

Solve the following problems based on transformations of the graphs of linear functions. Show all your work and check your solutions.

Practice Problems

1. For the following functions, describe the transformation from $f(x)$ to $g(x)$.

(a) $f(x) = \frac{1}{3}x + 3$, $g(x) = f(x) - 3$

(b) $f(x) = -3x + 4$, $g(x) = f(x) + 1$

(c) $f(x) = -x - 2$, $g(x) = f(x) + 5$

(d) $f(x) = \frac{1}{2}x - 5$, $g(x) = f(x - 3)$

2. Graph the function and describe the transformation from the parent function $f(x) = x$:

(i) $f(x) = x + 3$

(iv) $f(x) = \frac{1}{2}x$

(ii) $f(x) = x - 5$

(v) $f(x) = -x$

(iii) $f(x) = 2x$

(vi) $f(x) = -2x + 4$

3. Write the equation of the transformed function for the following cases:

- (i) A translation of 4 units to the left.
- (ii) A translation of 3 units up.
- (iii) A vertical stretch by a factor of 3.
- (iv) A reflection over the x-axis and a translation of 2 units down.
- (v) A horizontal compression by a factor of $\frac{1}{2}$.
- (vi) A vertical shrink by a factor of $\frac{1}{3}$.

4. **Identify the transformation that occur in each of the following cases:**

- | | |
|--------------------------------|----------------------|
| (i) $f(x) = -2x + 5$ | (iv) $f(x) = -x + 1$ |
| (ii) $f(x) = \frac{1}{2}x - 3$ | (v) $f(x) = x - 7$ |
| (iii) $f(x) = 3x - 4$ | (vi) $f(x) = 4x + 6$ |

Multiple-Choice Questions

- What transformation occurs to the graph of $f(x) = x$ to create the graph of $f(x) = x + 5$?
 - A. Vertical translation 5 units up
 - B. Horizontal translation 5 units to the right
 - C. Vertical translation 5 units down
 - D. Horizontal translation 5 units to the left
- The graph of $f(x) = 3x$ is a transformation of the graph of $f(x) = x$. What type of transformation is this?
 - A. Horizontal compression
 - B. Vertical stretch
 - C. Vertical compression
 - D. Reflection over the y-axis
- The graph of $f(x) = -x$ is a transformation of $f(x) = x$. What type of transformation is this?
 - A. Reflection over the x-axis
 - B. Reflection over the y-axis
 - C. Vertical stretch
 - D. Horizontal translation