Instructions

Answer the following questions related to shifts and stretches/compressions of linear functions. Show your work where applicable.

1. Understanding Shifts

What is a vertical shift of a linear function? Provide an example of a linear function that has been shifted vertically.

2. Horizontal Shift

How does a horizontal shift affect the graph of a linear function? Explain and give an example.

3. Stretches and Compressions

Define what is meant by vertical stretch and compression in the context of linear functions.

4. Example Problem

Given the function $f(x) = 2x + 3$, describe what happens to the graph of the function when you apply a vertical compression by a factor of 1/2. Write the new equation.

5. Challenge Question

The graph of $y = x$ is shifted 4 units to the left and then stretched vertically by a factor of 3. Write the new equation of the transformed function.

6. Reflection

What is the most challenging aspect of understanding shifts and transformations of linear functions for you? Explain your thoughts.

7. Visual Representation

Sketch the transformation for the function y = x after applying a shift up 5 units. Label your axes and the original and transformed functions.