Transformations of Linear Functions, Parallel and Perpendicular Lines WS
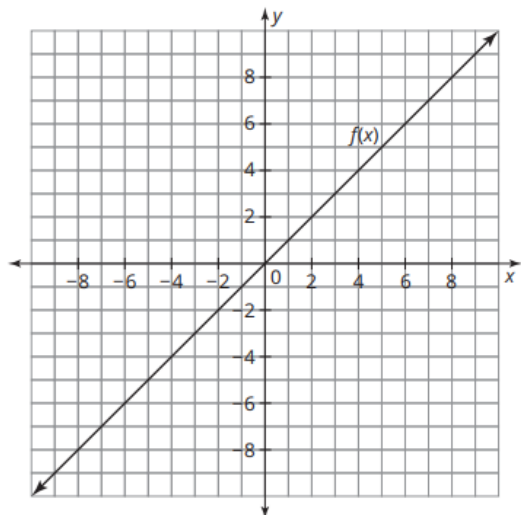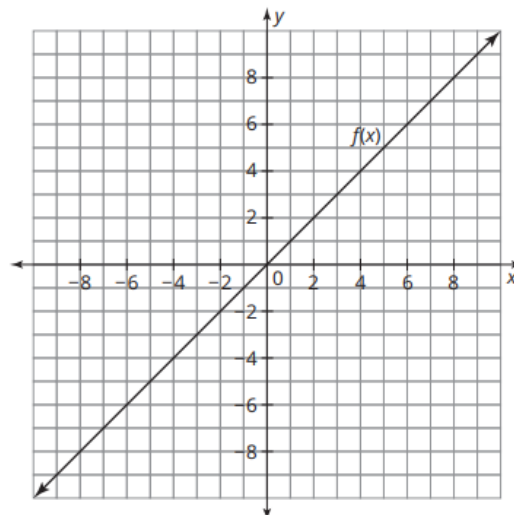
The equation and graph of the basic linear function $f(x) = x$ are given. The equation of a transformed function $g(x)$ is also given. Describe the transformation(s) performed on $f(x)$ to produce $g(x)$ and graph $g(x)$.

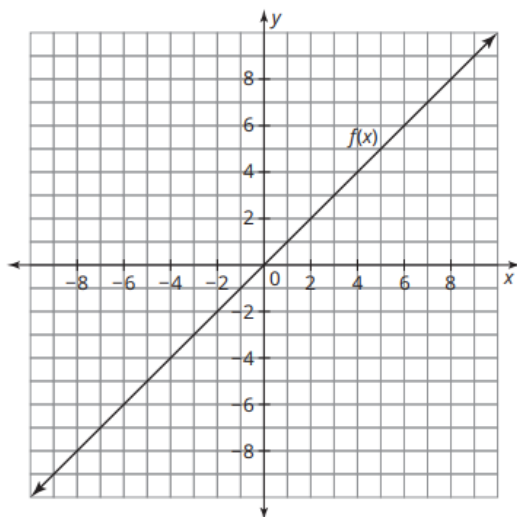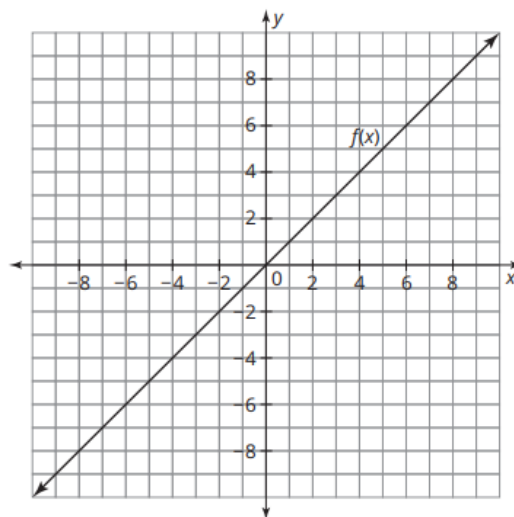1) $f(x) = x$
$g(x) = f(x) + 5$

2) $f(x) = x$
$g(x) = \frac{2}{3}f(x)$

3) $f(x) = x$
$g(x) = f(x) - 4$

4) $f(x) = x$
$g(x) = 4f(x)$

Write an equation for each translated function $g(x)$ in terms of $f(x)$, and then simplify the equation.

5) $f(x) = 3x + 1$ is translated 9 units up.

6) $f(x) = -2x - 7$ is translated 12 units down.

Determine an equation for each line described.

7) What is the equation of a line parallel to $y = \frac{4}{5}x + 2$ that passes through (1, 2)?

8) What is the equation of a line parallel to $y = -\frac{1}{2}x + 6$ that passes through (−4, 1)?

9) What is the equation of a line parallel to $y = -4x - 7$ that passes through (2, −9)?

10) What is the equation of a line perpendicular to $y = -\frac{2}{5}x - 1$ that passes through (2, −8)?

11) What is the equation of a line perpendicular to $y = \frac{3}{4}x + 12$ that passes through (12, 3)?

12) What is the equation of a line perpendicular to $y = 6x - 5$ that passes through (6, −3)?