

Name: _____

Date: _____

1-7 INVERSES OF LINEAR FUNCTIONS**FLUENCY**

1. The graph of a function and its inverse are always symmetric across which of the following lines?

- (1) $y = 0$ (3) $y = x$
 (2) $x = 0$ (4) $y = 1$

2. Which of the following represents the inverse of the linear function $y = 3x - 24$?

- (1) $y = \frac{1}{3}x + 8$ (3) $y = -\frac{1}{3}x + 24$
 (2) $y = -\frac{1}{3}x - 8$ (4) $y = \frac{1}{3}x - \frac{1}{24}$

3. If the y -intercept of a linear function is 8, then we know which of the following about its inverse?

- (1) Its y -intercept is -8 . (3) Its y -intercept is $\frac{1}{8}$.
 (2) Its x -intercept is 8. (4) Its x -intercept is -8 .

4. If both were plotted, which of the following linear functions would be parallel to its inverse? Explain your thinking.

- (1) $y = 2x$ (3) $y = 5x - 1$
 (2) $y = \frac{2}{3}x - 4$ (4) $y = x + 6$

5. Which of the following represents the equation of the inverse of $y = \frac{4}{3}x + 24$?

- (1) $y = -\frac{4}{3}x - 24$ (3) $y = \frac{3}{4}x - 18$
 (2) $y = -\frac{3}{4}x + 18$ (4) $y = \frac{4}{3}x - 24$

6. Which of the following points lies on the inverse of $y + 2 = 4(x - 1)$?

- (1) $(2, -1)$ (3) $\left(\frac{1}{2}, 1\right)$
 (2) $(-1, 2)$ (4) $(-2, 1)$

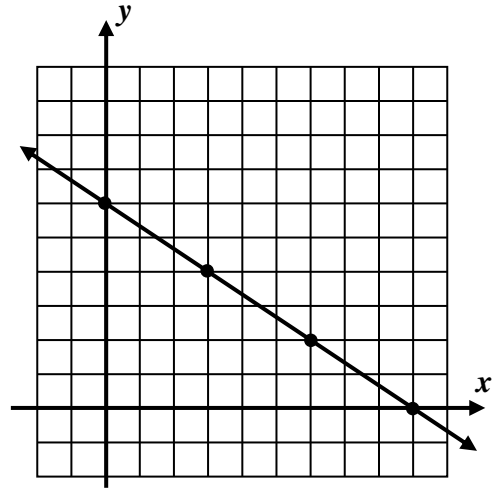
7. A linear function is graphed below. Answer the following questions based on this graph.

(a) Write the equation of this linear function in $y = mx + b$ form.

(b) Sketch a graph of the inverse of this function on the same grid.

(c) Write the equation of the inverse in $y = mx + b$ form.

(d) What is the intersection point of this line with its inverse?



APPLICATIONS

8. A car traveling at a constant speed of 58 miles per hour has a distance of y -miles from Poughkeepsie, NY, given by the equation $y = 58x + 24$, where x represents the time in hours that the car has been traveling.

(a) Find the equation of the inverse of this linear function in $y = \frac{x - a}{b}$ form.

(b) Evaluate the function you found in part (a) for an input of $x = 227$.

(c) Give a physical interpretation of the answer you found in part (b). Consider what the input and output of the inverse represent in order to answer this question.

REASONING

9. Given the general linear function $y = mx + b$, find an equation for its inverse in terms of m and b .