

Assignment

Write

Describe how to use a graph to prove two relationships are inverses of each other.

Remember

An inverse of a function “undoes” the function. The inverse of a function is determined by replacing $f(x)$ with y , switching the x and y variables, and solving for y . A one-to-one function is a function in which its inverse is also a function.

Practice

1. Clothing and shoe sizes typically vary from country to country. Kalinda is going to be spending a year in Italy and plans on shopping for dresses while she’s there. While investigating the differences in sizing, she determines that to change the U.S. dress size to an Italian dress size, she must add 12 to the U.S. dress size and then double the sum.

- Complete the table of values to show the dress size conversion for U.S. dresses to Italian dresses.
- Write a function, $f(x)$, to represent the Italian dress size in terms of x , the U.S. dress size.
- Determine the inverse of this problem situation using words.
- Determine the inverse of the function algebraically. What does the inverse function represent in terms of the problem situation?
- Sketch the graph of the original function. Then, sketch the inverse on the same graph.

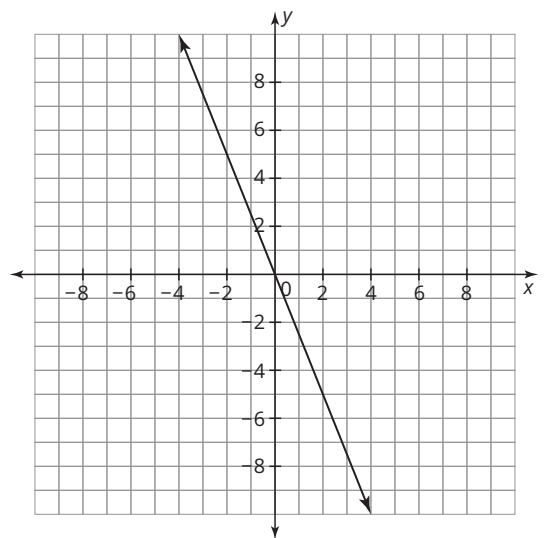
U.S. Dress Size	Italian Dress Size
4	
6	
10	
14	
18	

2. Determine the inverse of each function. Is the inverse also a function? Explain why or why not.

a. $f(x) = 0.6x - 2$ b. $g(x) = \frac{8}{3}x + 12$

3. Determine whether the functions $j(x) = 3 - 1.5x$ and $k(x) = -\frac{2}{3}x + 2$ are inverses. If so, explain how you know. If not, determine each function’s inverse.

4. Sketch the inverse of the given function on the same graph as the function. Is the inverse also a function? Explain why or why not.



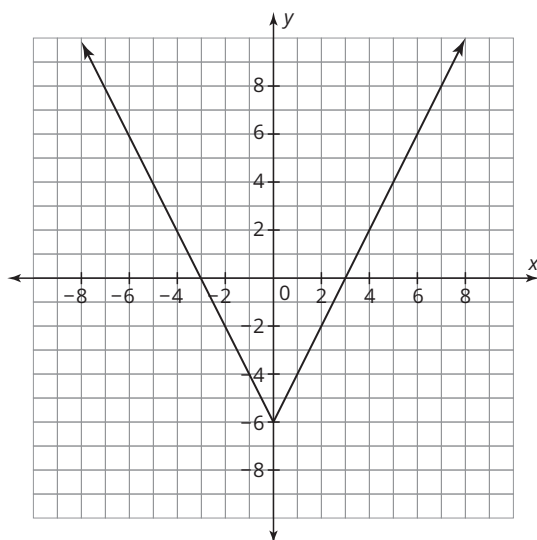
Stretch

1. For the function $f(x) = x + 1$, the inverse function is $f^{-1}(x) = x - 1$. Evaluate the function $f(x)$ by replacing x with $x - 1$. What do you notice? How does this relate to the process of using a graph to determine an inverse?

Review

1. A school P.T.A. is organizing a Fun Run to benefit the school. A local business has agreed to donate cases of lemonade, with the following conditions:
 - for less than 50 runners they will donate two cases,
 - for at least 50 but less than 100 runners they will donate five cases,
 - for at least 100 but less than 150 runners they will donate twelve cases, and
 - for at least 150 runners they will donate twenty cases.
 - a. Write a piecewise function $f(x)$ for the number of cases the business will donate, x .
 - b. Is this piecewise function a step function? Explain your reasoning.
 - c. Graph the function. Be sure to label the axes.
 - d. Describe the rate of change when $100 \leq x < 150$. What does it mean in terms of the problem situation?
 - e. The P.T.A. has 79 runners signed up for the Fun Run. How many cases of lemonade will they get? Explain your reasoning.
2. Each graph represents a form of the function $g(x) = Af(x) + D$, given $f(x) = |x|$. Determine A and D , and then explain the transformations those values make on the basic linear absolute value function. Write the function in terms of the basic function.

a.



b.

