

## Inverse Relations (1.5)



"I know how to find the equation and graph of an inverse relation, and I can state its properties. Also, I know under what conditions the inverse relation is a function. I can apply what I have learned in familiar and unfamiliar settings."

**inverse**  
(loosely stated)

An **inverse** is something that is the opposite or reverse of something else. When a mathematical operation does something with terms, its inverse operation undoes it.



Functions have inverses too!

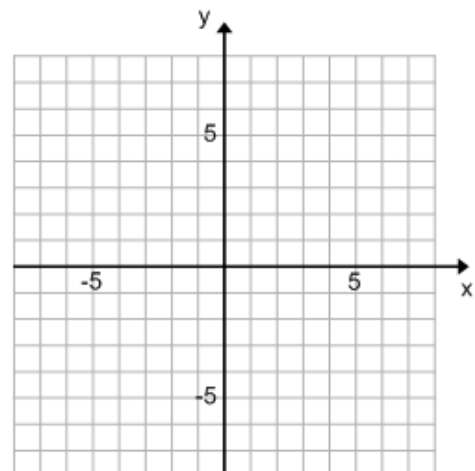


An **additive inverse** is what is added to get zero.

A **multiplicative inverse** is what is multiplied to give one.

### **Example 1:**

- Using only a table of values, graph  $y = 2x$
- Using a table of values, graph its inverse relation.
- State the equation of the inverse relation.



- Compare the graphs.

## inverse relation

(formally stated)

Given a relation  $R$ . Then the relation

$$R^{-1} = \{(y, x) | (x, y) \in R\}$$

is the inverse relation of  $R$ .

All properties of the independent variable in a relation  $R$  correspond to the properties of the dependent variable in its inverse  $R^{-1}$ , and vice versa.

## Example 2:

- a) Determine the equation of the inverse relation of  $f(x) = (x-3)^2 + 4$   
b) Without graphing, is the inverse relation a function? Explain.

**MathSIP!** Page 43 #1cd, 2d, 3, 4\*\*, 6d, 10e, 12c, 13ab, 14, 16.

\*\*Create a table of values using -3,-2,-1,0,1,2,3 for  $y = x^3$  then graph it.



## Optional Quizzes

 <http://courseware.cemc.uwaterloo.ca/8/assignments/113/4>



 <http://courseware.cemc.uwaterloo.ca/8/assignments/113/5>



 <http://courseware.cemc.uwaterloo.ca/8/assignments/113/6>



 <http://courseware.cemc.uwaterloo.ca/8/assignments/113/7>

