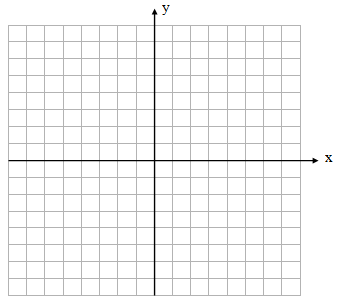
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| **INVERSE OF A RELATION** | **INVERSE OF A LINEAR FUNCTION** |
| **INVESTIGATE**:  a) Plot the points: A(−4, 2) B(−2, 0), C(0, 5), D(2, 5), E(3, 7)  b) Join the points in order, from A to E, using straight line segments.  c) State the Domain (D) and Range (R) of this function.    **D** =  **R** =  d) Interchange the Domain and Range and re-plot the points.  **A(−4, 2) becomes A' (2, −4)**    e) Again, join the points in order from A' to E'.  f) State the Domain and Range of the new relation.  *This is called the* ***INVERSE*** *relation of the original.*  **D** =  **R** =  g) Is the new relation also a function? Why or why not?  h) Graph the line **y = x**  i) How does the original function and its inverse seem to be related to the line y = x? | **INVESTIGATE:**  a) Graph the linear function:  **y = 2x + 4**  b) Interchange the x and y in the above equation and rearrange it to solve for **y**.  Step 1: x = 2y + 4      c) The result is the inverse equation for the original function: **y = 2x + 4:**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  d) Is the inverse also a function? If so, what type?    e) Graph the inverse and state how it is related to the original function and the line y = x.  g) State the Domain and Range for both y = 2x + 4 **and** for its inverse.  h) Find the inverse equation for the linear function: |

**INVESTIGATE: Inverse of a Quadratic Function**

a) Graph the quadratic function:  **y = x2 + 3**

b) State its Domain and Range.

D =

R =

c) Graph the inverse of this function by interchange x and y values for each point.

d) Is the inverse a function?

e) State the Domain and Range for the Inverse.

D =

R =

f) Find the Inverse Equation by interchanging x and y in the original equation and isolating **y**.

**x = y2 + 3**

g) Sometimes, the inverse of a function is not also a **function**. In these cases, we **restrict** the domain of the **original** function so that its reflection in the line y = x is also a function.

**If a relation is a function, the notation: f(x) may be used. If a function's inverse is also a function, the notation: f−1(x) is used. Note that f-1 is not an exponent; therefore, it is not 1/f**

For **y = x2 + 3** the domain would be: . We are restricting the x values that are less than 0 so that the inverse function can pass the VLT test. In other words, when you graph the function, just draw the right arm of the parabola because it is where the x values are greater than or equal to 0.

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| a) Restrict the left arm, then inverse the function | a) Restrict the right arm, then inverse the function |
|  |  |

**Practice**

1. Find the inverse for each relation.

a) {(1, -3), (-2, 3), (5, 1), (6, 4)} b) {(-5, 7), (-6, -8), (1, -2), (10, 3)}

2) Find an equation for the inverse for each of the following relations.

a) y = 3x + 2 b) y = -5x - 7 c)

d) D = {x e) D = {x f) ,

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