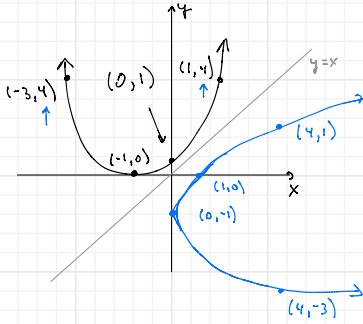


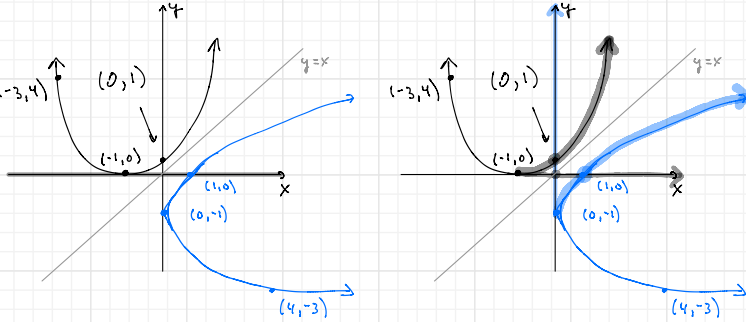
1. Worksheet 9

1. Graph the function  $f(x) = (x+1)^2$ . Then reflect the graph of  $f$  about the line  $y = x$ . (Comment: When you reflect the graph about the line  $y = x$ , you interchange the roles of the  $x$  and  $y$  coordinates.) **Is the reflection of this graph the graph of a function?**



The blue curve is **NOT** the graph of a function. It fails the vertical line test. For example, if  $x=1$ , the points  $(1, 0)$  and  $(1, -2)$  are on the graph.

2. Restrict the domain of  $f$  given by  $f(x) = (x+1)^2$  in the simplest way possible so that  $f$  becomes invertible on that domain and the range of the inverse is an interval containing zero.



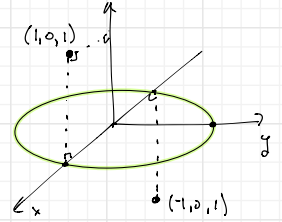
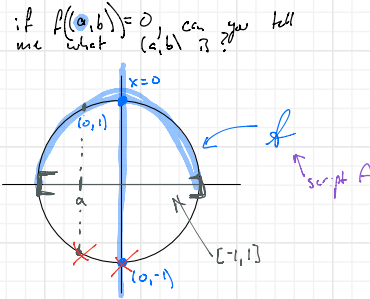
The restriction of  $f$  to the interval  $(-\infty, -1]$  is an invertible function. The point 0 is in the domain of this restricted function, so the point 0 is in the range of the inverse.

3. Consider the function,  $f$ , that projects the unit circle,  $C$ , onto the  $x$ -axis. This is the function

$$f: C \rightarrow [-1, 1] \text{ defined by } f((a, b)) = a.$$

Is this function invertible? If not, find the largest arc,  $A$ , on the circle and containing  $(0, 1)$  where it is invertible. You should highlight this arc  $A$ .

domain =  $C$



The arc  $A$  is the top half of the unit circle. It is all of the points on the unit circle with nonnegative  $y$ -coordinate.

