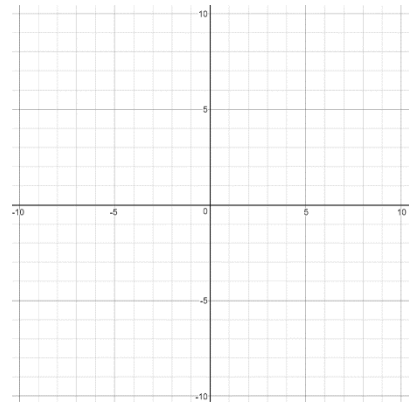# Precalculus Unit 1: 1.6 Homework
Inverse Functions
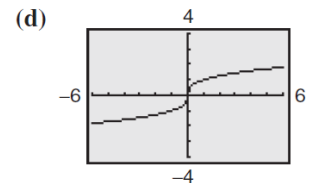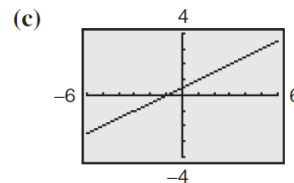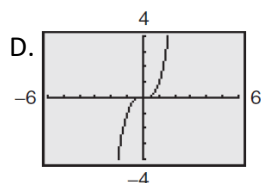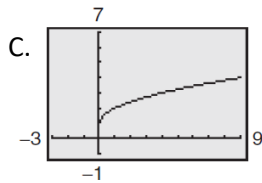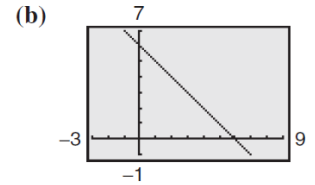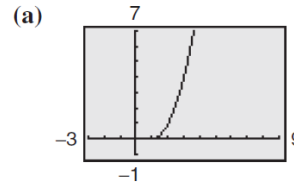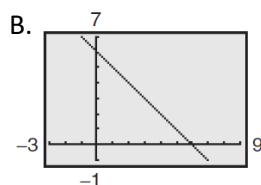
Find the inverse function for f and then verify that your inverse function is correct using $f\left(f^{-1}(x)\right)$ and $f^{-1}(f(x))$.

1. $f(x) = 2x + 1$

2. Verify algebraically that $f(x) = -\frac{7}{2}x - 3$ and $g(x) = \frac{-2}{7}x - \frac{6}{7}$ are inverses using composition. Also verify geometrically on the provided graph.

3. Match the graph of each function with the graph of its inverse function.
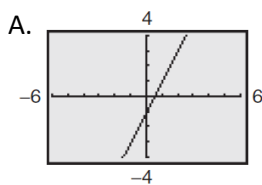
4. What does it mean for a function to be one-to-one? Give an example of a function that is one-to-one.

5. What is the test to determine if a function is one-to-one? Why does this test work?

6. Why do we need to test if a function is one-to-one before finding its inverse?

7. Find the inverse of the following functions:

   a. $f(x) = x^3 + 1$

   b. $g(x) = \frac{x+3}{x-2}$

8. Restrict the domain for the function $h(x) = (x - 3)^2$ so that it is a one-to-one function and find its inverse. What is the domain of $h^{-1}(x)$?

9. Could the following situation be represented by a one-to-one function? Why or why not?

   The number of miles n a marathon runner has completed in terms of the time t in hours.