Name: _____   Date: _____

2.7 Inverse of a Function

1. Determine the equation of the inverse for the given functions.
  a) $f(x) = 3x - 4$
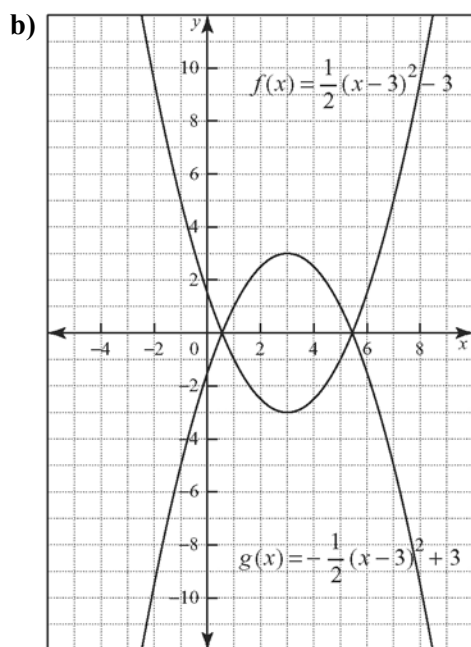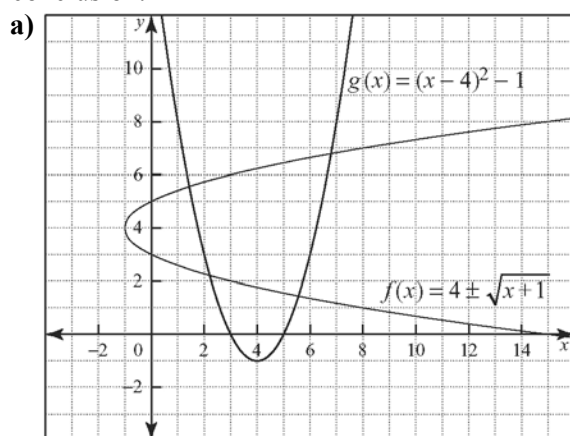 **b)** $f(x) = 3x^2 + 6x + 4$
  c) $f(x) = \sqrt{x + 3} - 1$
  d) $f(x) = \dfrac{3}{x - 2} + 2$

2. For the original functions and their inverses in question 1, state any restrictions on x.

3. For each graph, determine if the two relations shown are inverses of each other. Justify your conclusion.
  a)

  b)

4. The cost to rent a car for a day is a flat rate of $60, plus an additional $0.20/km travelled. Let C represents the cost of a one-day rental and x represents the number of kilometres driven.
  a) Develop a function for the cost of a one-day rental as a function of x.
  b) Determine the inverse of the cost function.
  c) What does the inverse function represent?

5. Jennifer missed the class on inverse functions. She is given an inverse function $f^{-1}(x)$ and is asked to find the original function. She starts by writing $f^{-1}(x)$ as $\dfrac{1}{f(x)} = \dots$. Explain what she has done and why it is incorrect.

6. For the function $f(x) = 3(x - 2)^2 + 1$,
  a) Find the inverse function $f^{-1}(x)$.
  b) Determine the simplified expression for $f^{-1}(f(x))$ by placing the function $f(x)$ in for x in the inverse.
  c) Determine the simplified expression for $f(f^{-1}(x))$ by placing the inverse function in for x in the $f(x)$ function.
  d) Are the results from parts b) and c) the same? Explain why or why not.

7. A sale at an electronics store has 30% off plasma TVs.
  a) Write a function that gives the sale price as a function of the original price.
  b) Find the inverse of this function.
  c) What does this inverse function represent?