Name _____

Homework 4
Section 1.3

1. (6) Given that $g(x) = x^2 + x$, compute and simplify the expression $\dfrac{g(x+h) - g(x-h)}{2h}$

2. (3ea) Determine functions $f(x)$ and $g(x)$ so that $f\left(g(x)\right) = h(x)$ for the following functions $h(x)$. Do not use $f(x) = x$ or $g(x) = x$.

   (a) $h(x) = (x^2 + 1)^{15}$

   (b) $h(x) = e^{\sqrt{x}}$

3. (2ea) Suppose the function $C = f(q)$ gives the cost (in dollars) of producing $q$ sprockets.

   (a) Explain the practical meaning (in terms of dollars and sprockets) of the expression $f(150) = 250$.

   (b) Explain the practical meaning (in terms of dollars and sprockets) of the expression $f^{-1}(500) = 350$.

4. (2ea) Suppose the point $(-4, 9)$ lies on the graph of the invertible function $f(x)$. What point MUST lie on the graph of the following functions?

   (a) $2f(x + 1) - 3$

   (b) $f^{-1}(x) - 3$