Quiz 7 **MATH-1150-ES34** **2012 January 31**

1 *Given*

$$f(x) = 4x + 2,$$

find a formula for the inverse of f. Show at least *what equation you solve to find this, as well as your final answer.*

I set $f(x) = y$ and solve for x to find $f^{-1}(y)$:

$$\begin{aligned} f(x) &= y; \\ 4x + 2 &= y; \\ 4x &= y - 2; \\ x &= \frac{1}{4}y - \frac{1}{2}; \\ f^{-1}(y) &= \frac{1}{4}y - \frac{1}{2}. \end{aligned}$$

2 *Suppose that f is a one-to-one function and $f(7) = 13$.*

a **Extra credit:** *Do you know what $f^{-1}(7)$ is? If so, say what it is.*

To know what $f^{-1}(7)$ is, I'd need to know some x such that $f(x) = 7$. However, I **do not know** this.

b *Do you know what $f^{-1}(13)$ is? If so, say what it is.*

I **do know** this. Since $f(7) = 13$,

$$f^{-1}(13) = 7.$$

3 *Suppose that g is a one-to-one function, the domain of g is $(-\infty, 0]$, and the range of g is $[0, \infty)$. State the domain and range of g^{-1} (indicating which is which).*

The domain of g^{-1} is the same as the range of g:

$$\operatorname{dom} g^{-1} = \operatorname{ran} g = [0, \infty).$$

Similarly, the range of g^{-1} is the same as the domain of g:

$$\operatorname{ran} g^{-1} = \operatorname{dom} g = (-\infty, 0].$$