Math 111 Worksheet #4
October 9, 2007

1. The current exchange rate between the dollar and the euro is that \$1 is equal to .7065 euros. Let D = currency amount in dollars and E = the corresponding amount in euros.

   (a) How much is \$500 worth in euros?

   To find the value of \$500 in euros, we must multiply the following:
   $$500(.7065) = 353.25 \text{ euros.}$$
   So, \$500 is worth 353.25 euros.

   (b) Find $E = f(D)$ (E as a function of D.)

   $$E = f(D) = .7065D$$

   The current exchange rate between the euro and the loonie (Canadian dollar) is that 1 euro is equal to 1.389 loonies.

   (c) Find $L = g(E)$ where L = value in loonies.

   $$L = g(E) = 1.389E$$

   (d) How much is \$500 worth in loonies?

   From part (a), we know that \$500 is worth 353.25 euros.

   Using the equation from part (c), we have that $L = g(353.25) = 1.389(353.25) = 490.66425$, which tells us that 353.25 euros is equal to approximately 490.66 loonies.

   So, \$500 is approximately equal to 490.66 loonies.

   (e) Find and interpret $L = g(f(D))$. What are the units of the input and output variable?

   $$L = g(f(D)) = g(.7065D) = 1.389(.7065D) = .9813285D$$

   This function now gives us the value in loonies for a given amount in dollars. The units of the input variable are dollars and the units of the output variable are loonies.

   (f) Find and interpret $g(f(10))$.

   $$g(f(10)) = .9813285(10) = 9.813285$$

   This tells us that \$10 is worth approximately 9.81 loonies.

2. Suppose the quantity sold q (in millions) of a particular energy drink on a given day is a function of its price p (in dollars) given by $q = f(p) = -.3p + 1.35$.

   (a) How many drinks are sold if the price is \$2.00?

   Since $f(2) = -.3(2) + 1.35 = .75$, we have that .75 million (or 750,000) energy drinks will be purchased on a given day if the price is \$2.00.

   (b) Find the inverse function $p = f^{-1}(q)$. What are the units of the input and output variable?

   Solving for p: $p = \frac{q-1.35}{-.3}$ or $p = -\frac{10}{3}q + \frac{9}{2}$

   So, $p = f^{-1}(q) = \frac{q-1.35}{-.3}$ or $p = f^{-1}(q) = -\frac{10}{3}q + \frac{9}{2}$.

   The units of the input variable of f^{-1} are millions of energy drink and the units of the output variable are dollars.

   (c) Find $f^{-1}(.75)$.

   You can plug .75 into the function from part (b) $(f^{-1}(.75) = \frac{.75-1.35}{-.3} = 2)$
   or you can note that from part (a) we have that $f(2) = .75$, so we must have that $f^{-1}(.75) = 2$.

   (d) Find and interpret $f(2.5)$ and $f^{-1}(.6)$.

   $f(2.5) = -.3(2.5) + 1.35 = .6 \quad \Rightarrow \quad f^{-1}(.6) = 2.5$

   Both of these function statements mean that if the drink is priced at \$2.50, .6 million (or 600,000) will be sold on a given day.