NEW FUNCTIONS FROM OLD (1.3) NAME_____

1. Give values so that the table represents an invertible function

m	1	2	3	4	5
$f(m)$	0.09	3.2	5.91	7.80	9.40

For example - The values must be increasing

2. For what values of A and K will $S(t) = At^3 - K$ be a one-to-one function?

A and k can have any values except A=0

3. Determine if the following functions are invertible.

A. $f(d)$ is the amount of sales tax on an item of clothing that sells for d dollars.

No The tax on $10 is the same as the tax on $9.99

B. $g(t)$ is the number of students waiting in line at the UA Catcard Office on the first day of classes as a function of time since the office opened that morning.

No The number of students increases and decreases during the day.

4. The life expectancy, L, of a child can be modeled by the function below. The variable y is the year of birth in relationship to 1980. For example, $y = 0$ corresponds to 1980.

$$L(y) = \frac{y + 96.94}{0.01y + 1.3}$$

A. Give a practical interpretation of $L(10)$. $L(10) = \frac{10 + 96.94}{0.01(10) + 1.3} \approx 76.386$

If a child is born in 1990, his or her life expectancy is about 76.4 years

B. Give a practical interpretation of $L^{-1}(78)$.

This represents the number of years after 1980 a child is born who has a life expectancy of 78 years.

C. Find the values of $L(10)$ and $L^{-1}(78)$.

$$78 = \frac{y + 96.94}{0.01y + 1.3}$$

$$78(0.01y + 1.3) = y + 96.94$$

$$0.78y + 101.4 = y + 96.94$$

$$4.46 = 0.22y$$

$$y = \frac{223}{11} = 20.\overline{27}$$

So, if life expectancy is 78 years, the child was born in 2000.