**2**. [14 points]

**a.** [10 points]  Let $f(c)$ be Lucy's revenue (in dollars) when she sells $c$ eggs at the farmers market.  Let $c_0$ be the number of eggs she sold on Saturday.  Write a mathematical expression that completes each of the following statements.  All your answers should be in terms of the function $f$.

*Solution:*

i)  Lucy's revenue, in dollars, when she sells 25% more eggs than she sold on Saturday is

Answer: $f(1.25c_0)$

ii)  Mark is another farmer selling eggs at the market. Mark's revenue on Saturday was 10 dollars less than Lucy's revenue that day. On Saturday Mark's revenue, in dollars, was

Answer: $f(c_0) - 10$

iii)  On Wednesday, Lucy sold 10 more eggs than on Saturday.  Lucy's revenue on Wednesday, in dollars, was

Answer: $f(c_0 + 10)$

iv)  Let $g(d)$ be Lucy's revenue in **hundreds** of dollars when she sells $d$ **dozen** eggs, then

$$g(d) = 0.01f(12d)$$

**b.** [4 points]  Find the equations of the horizontal and vertical asymptotes of each function below. If the given function does not have one of the asymptotes, write "NONE".

*Solution:*

i)  $y = 3(0.21)^{-2x}$

Horizontal Asymptote: $y = 0$         Vertical Asymptote: NONE

ii)  $y = 1 + \ln(0.2x + 1)$

Horizontal Asymptote: NONE         Vertical Asymptote: $x = -5$