4. [11 points] The UM Youtubers Club makes a very cool new video that goes viral. Suppose the video had 100 views at 2:00AM Eastern Time (ET) Saturday morning and the number of views grew exponentially for at least the next 24 hours, with views doubling every hour.

     a. [1 point] Between 3:00AM ET and 6:00AM ET Saturday, by what factor had the number of views increased?

<div align="right">Factor of increase: _____</div>

     b. [2 points] Write a formula for a function $V = f(t)$, where V is the number of video views and t is the number of hours since 2:00AM ET Saturday.

<div align="right">$V = f(t) =$ _____</div>

     c. [6 points] For each of the following expressions or equations, explain its meaning in the context of the problem, or explain why it doesn't make sense in the context of the problem.

         (i) $f^{-1}(500,000) \approx 12.25$

         (ii) $\frac{f(5)-f(3)}{5-3} = 1200$

     d. [2 points] Write a new function $g(s)$ **in terms of** f that would give us the number of views the video had s hours after 9:00AM ET on Saturday morning.

<div align="right">$g(s) =$ _____</div>