

Sheet #556: Exponential Equations and Exponential Models

Possibly helpful formulas: $y = A\left(1 + \frac{r}{n}\right)^{nt}$ $y = Ae^{kt}$ $y = A\left(\frac{1}{2}\right)^{t/T}$

1. Solve for x . Answer to three decimals.

$$2^{x+1} = 5$$

2. Solve for t . Answer to three decimals.

$$e^{0.1t} = 4$$

3. If the continuous exponential growth rate is 8%/hour and you start with an amount of 300 units. How many units do you have after 5 hours? (Answer to the nearest completed unit.)

4. A student began taking the AP History test at 8am ($t = 0$ hours). The student had 100% brain energy (y in percent) at that time. By 12noon, the student had 40% brain energy left. Use an exponential model to find the following.

a. Find the half life (T in hours) of brain energy. Answer to the nearest 10th of an hour.

b. Predict the brain energy left at 3pm. Answer to the nearest percent.