

Exponential Growth and Decay

Name _____

- 1) If the rate at which a population P grows is directly proportional to itself, then the equation we get from this is:

$$\frac{dP}{dt} = kP \quad \text{where } k \text{ is a constant.}$$

Use separation of variables to find a *general solution* for P

- 2) Given the function $P(t)$ for which you solved in #1, if the initial population is 50 and the population at $t = 5$ is 61, find the *particular solution* for $P(t)$ given these values.

- 3) At what time t will the population be doubled?

Compounded Interest

- 4) If you deposit \$1000 in an account that pays 3.5% interest each year, how much will you have next year at this time? the year after? 10 years from now? Write a formula to find how much money you will have t years from now?

- 5) Enter $\left(1 + \frac{1}{x}\right)^x$ into Y_1 on your calculator. Use this to find $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$. You will need this answer for our next class.