

Mathematics 172

Quiz #1

Name: Key

You must show your work to get full credit.

- (1) Let P be the size of a population that grows without constraints at an intrinsic rate of .05%. If $P(0) = 1000$ is the initial size of the population, then give a formula for the size of the population after time t .

1 pt

$$P(t) = \underline{1000e^{0.0005t}}$$

- (2) What is the solution to

2 pts

$$y' = .5y, \quad y(0) = 800$$

$$y(t) = \underline{800e^{.5t}}$$

2 pts

- (3) In the last question how long does it take for y to double?

want to solve

$$\text{Doubling time} = \underline{1.386}$$

$$y(t) = 800e^{.5t} = 2 \cdot 800$$

$$e^{.5t} = 2$$

$$.5t = \ln(2)$$

$$t = \frac{\ln(2)}{.5} = 1.386$$