Mathematics 172

Quiz 13 **Name:** Key

You must show your work to get full credit.

Let $P(t)$ be defined by the initial value problem

$$\frac{dP}{dt} = -.2P + 400, \qquad P(0) = 2{,}000$$

1. Give a formula for $P(t)$. $P(t) =$ 2000

The equ pt is when $-.2P+400=0$

$P = \frac{400}{.2} = 2000$

Let $y = P - 2000$, so $P = y + 2000$

$P' = y' = -.2(y+2000)+400 = -.2y$

$y = y(0)e^{-.2t}$

so $P = y(0)e^{-.2t} + 2000$

$P(0) = 2000$ so $y(0) = 0$

2. What is $P(3)$? $P(3) =$ 2000

3. Estimate $P(100)$. $P(100) \approx$ 2000