Mathematics 172

Quiz 6 **Name:** Key

You must show your work to get full credit.

Our most recent big result is that the solution to the initial value problem

$$P'(t) = rP(t) \qquad P(0) = P_0$$

where r and P_0 are constants is

$$P(t) = P_0 e^{rt}.$$

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1. (a) Solve

$$P'(t) = .1P(t) \qquad P(0) = 45$$

Here $r = .1$, $P_0 = 45$

So

$P(t) = P_0 e^{rt} = 45e^{.1t}$

$P(t) =$ $45e^{.1t}$

(b) What is $P(25)$?

$P(25) =$ 548.21

$P(25) = 45e^{.1(25)} = 548.21$

2. (a) Solve

$$\frac{dA}{dt} = -.2A, \qquad A(0) = 4.2$$

$r = -.2$

$A_0 = 4.2$

$A(t) = A_0 e^{rt} = 4.2e^{-.2t}$

$A(t) =$ $4.2e^{-.2t}$

(b) What is $A(17)$?

$A(17) =$ 0.1402

$A(17) = 4.2e^{-.2(17)} =$