Mathematics 172

Quiz #13 Name: Key

You must show your work to get full credit.

Given an initial value problem

$$\frac{dP}{dt} = .1P\left(1 - \frac{P}{10}\right), \qquad P(0) = 2.$$

1. Use one step of step size of $\Delta t = 1$ to estimate $P(1)$.

$P'(0) =$ .16

$P(1) \approx P(0) + P'(0)\Delta t =$ 2.16

2. Use two steps of size $\Delta t = .5$ to estimate $P(1)$.

$P'(0) =$ .16

$P(.5) \approx P(0) + P'(.5)\Delta t =$ 2.08

$P'(.5) =$ .164736

$P(1) \approx P(.5) + P'(.5)\Delta t =$ 2.162368