

Quiz 6

Davis
M212

Name:
Pledge:

- (8pts.) 1. The Pacific halibut fishery has been modeled by the differential equation $\frac{dP}{dt} = .4P(1 - \frac{P}{400}) - 30$. Use Euler's method with step size $h = 5$ to approximate the number of fish you have after 10 weeks starting with $P(0) = 120$.

- (8pts.) 2. A glucose solution is administered intravenously into the bloodstream at a constant rate. The glucose is converted into other substances at a rate proportional to the concentration at the time. The differential equation describing the concentration $y(t)$ is

$$\frac{dy}{dt} = 2 - y$$

Solve this differential equation. If $y(0) = .4$, find $y(.5)$ (time is being measured in hours, so $t = .5$ is half an hour later).

- (4pts.) 3. The half-life of cesium-137 is 30 years (the rate of decay of this radioactive material is proportional to the amount present). Suppose we have a 100 mg sample. How much of the sample remains after 100 years?