

Name:

Section: 11 12 13

1. A population grows according to the logistic equation

$$\frac{dP}{dt} = \frac{2}{100}P - \frac{4}{10000}P^2.$$

- (a) What is the carrying capacity M ? What is the constant k ?
- (b) Find a formula for $P(t)$ if $P(0) = 40$. You don't have to solve the DE, you can use the formula we developed in lecture.

2. A bacteria culture begins with 200 cells and grows at a rate proportional to its size. After half an hour the population has 360 cells.
- (a) Find a formula for the number of bacteria after t minutes.
 - (b) When will the population reach 5,000 bacteria?