

# MA 16010 LESSON 28: EXPONENTIAL GROWTH (PROBLEM SET)

**Example 2:** The rate of change of a population  $P$  is proportional to  $P$  (use  $k$  for the proportionality constant). Answer the following questions.

a) What is  $\frac{dP}{dt}$  ?

b) Find  $P$ .

c) If  $P = 200$  when  $t = 0$  and  $P = 400$  when  $t = 2$ , what is  $P(4)$ ?

d) If  $P = 200$  when  $t = 1$  and  $P = 400$  when  $t = 2$ , what is  $P(4)$ ?

**Example 3: In a savings account where the interest is compounded continuously, if the initial investment is \$500 and the annual interest rate is 3%, how much money will there be in 10 years?**

**How long does it take to double the initial investment?**

**Example 4: In a savings account where the interest is compounded continuously, if the initial investment is \$100 and there are \$150 in 8 years, what is the annual interest rate?**

**Example 5: Suppose you deposited \$15,000 in a saving account in which interest is compounded continuously. It takes 20 years to double your money in this account. What is the annual rate of interest?**