

# 9.8

## SM3 Financial Models & Growth and Decay Models

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Find the amount that results from each investment. Round answers to the nearest cent.

Compounded Interest:  $A = P\left(1 + \frac{r}{n}\right)^{nt}$

1. \$100 invested at 4% compounded quarterly after a period of 2 years.

2. \$1000 invested at 11% compounded monthly after a period of 2 years.

Compounded Continuously Equation:  $A = Pe^{rt}$

3. If Tanisha has \$100 to invest at 8% per annum compounded monthly, how long will it be before she has \$150?

Find the principal needed now to get each amount; that is, find the present value. Round answers to the nearest cent. Compounded Interest:  $A = P\left(1 + \frac{r}{n}\right)^{nt}$

4. To get \$100 after 2 years at 6% compounded monthly

5. To get \$300 after 4 years at 3% compounded quarterly

**Growth & Decay Applications** Law of uninhibited growth or decay:  $A(t) = A_0e^{kt}$

6. The size  $P$  of a certain insect population at time  $t$  (in days) obeys the function  $P(t) = 500e^{0.02t}$ .

- a) Determine the number of insects at  $t = 0$  days.
- b) What is the growth rate of the insect population?
- c) What is the population after 10 days?
- d) When will the population reach 800?
- e) When will the insect population double?

7. The population of a colony of mosquitoes obeys the law of inhibited growth.

- a) If there are 1000 mosquitoes initially and there are 1800 after day 1, find the rate of decay.
- b) What is the size of the colony after 3 days?
- c) How long is it until there are 10,000 mosquitoes?
- d) How long is it until the population doubles?