

Name

SM3 Financial Models & Growth and Decay Models

Period

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

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

1. \$100 invested at 4% compounded quarterly after a period of 2 years. $A = 100 \left(1 + \frac{64}{4}\right)^{4}$

.04=1 n= 4

A 24108.29 H

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

1000 = P 011=1 12=n

A=1000(1+ -12) 12,2 12

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? P=100

5. It ranisha has \$100 to invest at \$70 per annum compounded monthly, now long will it be before she has \$150? P = 100 $\frac{150 = 100 \, e^{.08 \, t}}{100 \, 100}$ $\frac{150 = 100 \, e^{.08 \, t}}{100 \, 100}$ $\frac{11.5 = .08 \, t}{.08}$ $\frac{11.5 \, t}{.08}$

nearest cent. Compounded Interest: $A = P(1 + \frac{r}{r})^{nt}$

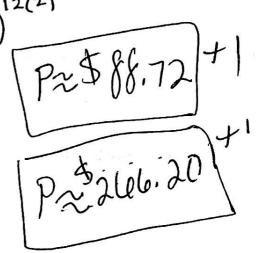
t=2 r=. Ub n=12

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

5. To get \$300 after 4 years at 3% compounded quarterly $A = 300 \qquad 300 = 9(1 + \frac{03}{4})$

$$A = 300 \qquad 300 = P(1 + \frac{03}{4})$$

$$t = 4 \qquad \frac{300}{11 + \frac{03}{4}} = P$$



Growth & Decay Applications Law of uninhibited growth or decay: $A(t) = A_0 e^{kt}$

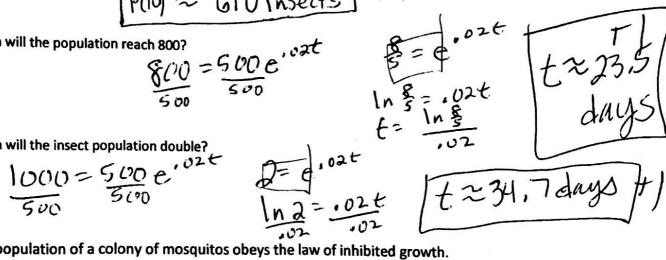


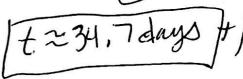
ereloisthe

- 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 = 0 days. 500 insects + 1
- b) What is the growth rate of the insect population? 21. +1

c) What is the population after 10 days?
$$\frac{7(10) = 500e^{.02(10)}}{P(10) \approx 610 \text{ insects}} + 1$$

- d) When will the population reach 800?
- e) When will the insect population double?





- 7. The population of a colony of mosquitos 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?
$$1000e^{58779(3)} = A \approx 5832 \text{ masquitous}$$

c) How long is it until there are 10,000 mosquitoes? .56779±

How long is it until the population doubles?

2000=1000 e 58779 t