

MATH 122, WORKSHEET 4

Show all work for full credit.

1. What interest rate, compounded annually, is equivalent to a 24.7% rate, compounded continuously?

2. What interest rate, compounded continuously, is equivalent to a 19.4% rate, compounded annually?

3. Put the function $P = 5000(0.78)^t$ in the form $P = P_0e^{kt}$.

Fill in the blank: Annual Rate: _____ Continuous Rate: _____

4. If the balance in an account increases exponentially from \$2000 in 2005 to \$12800 in 2011, what is the annual (not continuous) rate of growth?

5. A town's population increases exponentially from 7500 people in 2006 to 12000 people in 2010. If this growth continues, how many people would you expect to have in the town in 2015?

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6. An exponentially increasing bacteria has a doubling time of 8.2 hours. If you leave a 250mg sample unattended, how much would there be at the end of an entire day? Give units.

7. The size of a bacteria colony doubles every 4 hours. If the bacteria is growing exponentially, how long will it take the number of bacteria to be 5 times the original amount? Give units.

8. A substance has a half life of 28 days.

a. What percentage of the original sample would remain at the end of one week?

b. After how long would only 75% of the original sample remain? Give units.