

### PC 3-3 Group Practice Problems

I can model populations using exponential growth and decay equations

1. A colony of bacteria increases according to the law of uninhibited growth. If the number of bacteria doubles in 3 hours, how long will it take for the size of the colony to triple?
2. Traces of burned wood found along with ancient stone tools in an archaeological dig in Chile were found to contain approximately 1.67% of the original amount of carbon-14. If the half-life of carbon-14 is 5600 years, approximately when was the tree cut and burned?
3. A child's grandparents purchase a \$10,000 bond fund that matures in 18 years to be used for her college education. The bond fund pays 4% interest compounded twice a year. How much will the bond fund be worth at maturity?
4. A child's grandparents wish to purchase a bond fund that matures in 18 years to be used for her college education. The bond fund pays 4% interest compounded semiannually. How much should the purchase so that the bond fund will be worth \$85,000 at maturity? Solve algebraically and verify graphically.
5. The population of a colony of squirrels obeys the law of uninhibited growth. If there are 1000 squirrels initially, and there are 1800 after 1 month, what is the size of the colony after 3 months? How long until there are 10,000 squirrels? Show all work for credit.

### PC 3-3 Group Practice Problems

I can model populations using exponential growth and decay equations

1. A colony of bacteria increases according to the law of uninhibited growth. If the number of bacteria doubles in 3 hours, how long will it take for the size of the colony to triple?
2. Traces of burned wood found along with ancient stone tools in an archaeological dig in Chile were found to contain approximately 1.67% of the original amount of carbon-14. If the half-life of carbon-14 is 5600 years, approximately when was the tree cut and burned?
3. A child's grandparents purchase a \$10,000 bond fund that matures in 18 years to be used for her college education. The bond fund pays 4% interest compounded twice a year. How much will the bond fund be worth at maturity?
4. A child's grandparents wish to purchase a bond fund that matures in 18 years to be used for her college education. The bond fund pays 4% interest compounded semiannually. How much should the purchase so that the bond fund will be worth \$85,000 at maturity? Solve algebraically and verify graphically.
5. The population of a colony of squirrels obeys the law of uninhibited growth. If there are 1000 squirrels initially, and there are 1800 after 1 month, what is the size of the colony after 3 months? How long until there are 10,000 squirrels? Show all work for credit.