

## 7.3 Models of Growth and Decay Exponential Functions

**Write an exponential function for each situation then solve the problem.**

1. There are now 300 insects in a colony. The population doubles every 5 days. What is the population in 18 days?
2. For every meter a diver descends below the surface, the light intensity is reduced by 2.5%.  $P$  is the percent of surface light present. At a depth of 10m how much light remains?
3. A radioactive substance has a half-life of 6 years. If 20 grams are present initially, how much will remain after 2 years?

**Write an exponential function for each situation then solve the problem algebraically.**

4. The half-life of radioactive iodine is 8.2 days. After how long will only 25% of the iodine be present?
5. A bacteria starts with 6250 bacteria and doubles every 3 hours. When will the bacteria count be 50000?
6. A colony of insects numbers 500 and doubles every 8 days. How long ago was the population 125?
7. A radioactive substance has a half-life of 3.5 years. How long will it take for only 6.25% of it to remain?
8. A painting triples in value every 8 years. It is currently worth \$1000. When will the painting be worth \$243000?

**Use a Graphing Calculator to help solve the following problems.**

9. A piece of machinery valued at \$30,000 depreciates at a rate of 10% per year. How long will it take for it to reach a value of \$15,000?
10. \$1000 is invested at a rate of 3.2% compounded monthly. When will the investment be worth \$5000?