Name: $\qquad$ Block : $\qquad$

### 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 10 m 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 $\$ 243000$ ?
9. A piece of machinery valued at $\$ 30,000$ depreciates at a rate of $10 \%$ per year. How much will it be worth in 7 years?
10. $\$ 1000$ is invested at a rate of $3.2 \%$ compounded monthly. How much will it be worth is 50 years?

