

Date: \_\_\_\_\_

Name: \_\_\_\_\_

## PRACTICE Exponential Word Problems

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- Every 2 cm of a light filter reduces the intensity of the light passing through it by 10%. Let  $I$  represent the light intensity and  $t$  represent the thickness of the light filter in centimetres.
  - Which equation best models the situation?
  - What percent of the light will be transmitted by a filter that is 3.2 cm thick?
  - How thick is the filter if only 25% of light comes through?
- There are approximately 500 wolves in Algonquin Provincial Park. Under ideal conditions, this population would double every 35 years.
  - Which equation models this population growth?
  - How many wolves were in the park 10 years ago? (time will be negative)
  - How long till the population of wolves would triple?
- You have been given \$1000 Canada Savings Bonds that will earn 1.5% quarterly interest, compounded quarterly.
  - Write down the equation that represents this.
  - What is the value of the bond after 5 years?
  - How long till the value would reach \$1050?
- The number of insects in a colony doubles every 5 months. There are currently about 3500 insects in the colony.
  - Write an equation that models this population growth.
  - How many insects will there be after 16 months?
  - How many insects will there be after one year?
  - How long till the population reaches 30000?
- The population of marmots on Mt. Washington is estimated at 5000. If the growth of marmots is 5% every 2 years, what will be the population in 15 years?
- A cottage is originally bought for \$150 000. If the value of this cottage appreciates at the rate of 7% per year, what will the cottage be worth in 10 years?
- A colony of 10 000 bees doubles in number every 3 months. How many bees will be in the colony after 6 months?

### ANSWERS

- $L=100(0.9)^{(c/2)}$
  - 84.5%
  - 26 cm
- $W=500(2)^{(y/35)}$
  - 410 wolves
  - 55.5 years
- $V=1000(1.015)^{(y/(1/4))}$  or  $V=1000(1.015)^{(4y)}$  - more of this type next unit
  - \$1346.86
  - 0.819 of a year or 299 days
- $I=3500(2)^{(m/5)}$
  - 32164 insects
  - 18473 insects
  - 15 months
- $P=5000(1.05)^{(y/2)}$ , 7209 marmots
- $V=150\ 000(1.07)^y$ , \$295 072.70
- $B=10000(2)^{(m/3)}$ , 40000 bees