Name: _____ Date: _____

BLM 7–14

Chapter 7 Practice Test

1. Is each statement true (T) or false (F)?

a) The doubling time is the time needed for a radioactive sample to decay by half.

b) Given 3 ft = 1 yd, 1 yd^3 is equivalent to $\frac{1}{27}$ ft^3.

c) The value of $\left(5^{-3}\right)^{-2}$ is 1.

d) The graphs of the relations $y = 2^x$ and $y = 2^{-x}$ are reflections of each other through the x-axis.

2. Write each expression as a single power. Then evaluate. Express your answers as a whole number or fraction.

a) $\left(3^2\right)^3$ **b)** $2^2 \times 2^3$

c) $7^{-6} \div 7^{-7}$ **d)** $\left(\frac{1}{2}\right)^3 \times \left(\frac{1}{2}\right)^3$

e) $6^8 \div 6^6$ **f)** $5^7 \times 5^{-2} \times 5^{-5}$

3. Given the general equation of an exponential relation, $y = ab^x$, describe how you know if the relation represents exponential growth or decay.

4. The table shows how metric units of length are related to length measured in metres.

kilometre (km)	10^3 m
hectometre (hm)	10^2 m
decametre (dam)	10^1 m
metre (m)	10^0 m
decimetre (dm)	10^{-1} m
centimetre (cm)	10^{-2} m
millimetre (mm)	10^{-3} m

Convert each length to metres.

a) 3165 mm **b)** 0.23 km

c) 0.0016 hm **d)** 31.4 cm

5. The value, V, of a Van Gogh painting increases with time according to the relation $V = 84\,000(1.173)^t$, where t is the number of years since 1947.

a) What was the value of the painting in 1967?

b) What was the value of the painting in 2007?

6. The population of a colony of bees increases by 25% every four months. How many bees should a beekeeper start with today to have 10 000 bees in two years?

7. An earthquake with intensity 10^5 has a magnitude of 5 as measured on the Richter scale. In 1964, the magnitude of an earthquake in Alaska was 8.5. In 1966, the magnitude of an earthquake in Turkey was 6.9. How much more intense was the earthquake in Alaska compared to the earthquake in Turkey?

8. The population of algae cells in a sample is growing exponentially. The initial population is 8000. The table shows the population over time.

Time (h)	Population
0	8 000
1	8 752
2	9 575
3	10 474
4	11 459
5	12 538
6	13 715

a) Use a graphing calculator. Make a scatter plot of the data. Then, find the equation of the curve of best fit.

b) Use the equation to find the number of algae cells after 15 h and after 36 h.

c) How long will it take for the population to grow to 100 000?