Chapter 7 Test

1. Is each statement true (T) or false (F)?
   a) The equation $y = 3(x^2)$ is an example of an exponential relation.
   b) Given 12 in. = 1 ft, 1 in.^{3} is equivalent to $\frac{1}{172}$ ft^3.
   c) The value of $\left(\left(8^0\right)^{-4}\right)^3$ is 1.
   d) The graphs of the relations $y = 5^x$ and $y = 5^{\left(\frac{x}{2}\right)}$ 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 a fraction.
   a) $6^5 \times 6^{-4}$ **b)** $7^8 \div 7^5$
   c) $\left(2^4\right)^3$ **d)** $\left(\frac{1}{3}\right)^2 \times \left(\frac{1}{3}\right)^4$
   e) $9^{-2} \div 9^{-4}$ **f)** $6^6 \times 6^{-4} \times 6^2$

3. a) Write the equation of an exponential relation that represents exponential growth.
   b) Write the equation of an exponential relation that represents exponential decay.

4. The table shows how some metric units of mass are related to mass measured in grams.

kilogram (kg)	10^3 g
gram (g)	10^0 g
milligram (mg)	10^{-3} g

Convert each mass to grams.
   a) 4525 mg   **b)** 6.29 kg

5. The population of bacteria in a culture increases by 26% every hour. The initial population was 1450. What will be the population after 10 h?

6. The value, V, of a sculpture is increasing according to the relation $V = 740 (1.183)^t$, where t is the number of years since 1953.
   a) Find the value of the sculpture in 2003.
   b) In which year did the value increases to over one million dollars? Hint: Use a graph or systematic trial.

7. An earthquake with intensity 10^5 has a magnitude of 5 as measured on the Richter scale. In 1933, the magnitude of an earthquake in Baffin Bay, NWT, was 7.3. In 1918, the magnitude of an earthquake on Vancouver Island, BC, was 6.9. How much more intense was the earthquake in Baffin Bay compared to the earthquake on Vancouver Island?

8. The table shows the value of an investment over time.

Time (years)	Value ($)	Time (years)	Value ($)
0	1500.00	6	2960.70
1	1680.00	7	3316.00
2	1881.60	8	3713.90
3	2107.40	9	4159.60
4	2360.30	10	4658.80
5	2643.50		

   a) Use the graphing calculator. Make a scatter plot of the data. Then find the equation of the curve of best fit.
   b) What was the initial investment?
   c) When will the investment be worth $5844.00?
   d) What will the value of the investment be after 15 years?