1. Could the table

\[
\begin{array}{c|ccccc}
   \hline
   \hline
   y  & 1.38 & 1.23 & 1.10 & 0.95 & 0.80 \\
   \hline
\end{array}
\]

represent a linear function?

(a) yes  (b) no

2. A computer vendor has fixed costs of $65000 per month and variable costs of $800 per computer. The vendor sells the computers at a price of $1400. Find a formula for the profit in terms of the quantity \( q \) sold.

\[
\begin{align*}
   & (a) \quad \pi(q) = 65000 + 600q \\
   & (b) \quad \pi(t) = 65000 - 600q \\
   & (c) \quad \pi(q) = 600q - 65000 \\
   & (d) \quad \pi(t) = 2200q + 65000 \\
   & (e) \quad \text{none of these}
\end{align*}
\]
3. Consider the polynomial

\[ p(x) = 34x^5 + 5x^3 - 6x - 108. \]

State the degree of this polynomial and whether the leading coefficient is positive or negative.

4. Suppose the table

\[
\begin{array}{ccc}
  x & 0 & 1 & 2 \\
  y & 48 & 72 & 108 \\
\end{array}
\]

consists of values for an exponential function \( y = f(x) \). Find \( f(-1) \).

5. Write the equation \( P = 1200(0.5)^t \) in the form \( P = P_0 e^{kt} \). What is \( P_0 \) and what is \( k \)?
6. Let \( f(x) \) and \( g(x) \) be defined by the tables

\[
\begin{array}{c|ccccccc}
 x & 0 & 1 & 2 & 3 & 4 & 5 \\
 f(x) & 5 & 9 & 9 & 5 & 4 & 13 \\
\end{array}
\]

and

\[
\begin{array}{c|ccccccc}
 x & 0 & 1 & 2 & 3 & 4 & 5 \\
 g(x) & 4 & 14 & 13 & 8 & 5 & 4 \\
\end{array}
\]

Find \( f(x) + 3g(x - 1) \) when \( x = 3 \).

7. Which of the following functions has the largest percent growth rate?

(a) \( P(t) = 90(1.12)^t \)
(b) \( P(t) = 80(1.13)^t \)
(c) \( P(t) = 70(1.14)^t \)
(d) \( P(t) = 60(1.15)^t \)
(e) \( P(t) = 50(1.16)^t \)
8. You have been awarded most valuable employee. You may either collect $10000 in 30 years when you reach retirement age or opt to immediately receive $2000. Assuming a growth rate of 5.5% per year compounded yearly, which is a better option in terms of future value 30 years from now?

(a) collect $10,000 in 30 years
(b) collect $2000 right now
(c) the future value of either option is the same

9. Write the function

\[ y = (2x^{-2})^3 \]

as a power function in the form \( y = kx^p \).

(a) \( y = 8x^2 \) \hspace{1cm} (b) \( y = 2x^{-6} \)
(c) \( y = 8x^{-2} \) \hspace{1cm} (d) \( y = 2x^6 \)
(e) none of these
10. Compute the average rate of change for the function

\[ f(x) = \ln(x) \] over the interval \( 1 \leq x \leq 3. \]

11. Every year a company decreases its research and development budget by 5%. How many years does it take for the budget to halve?
12. Uranium-238, which is employed in depleted uranium anti-tank shells, has a half-life of 4.5 billion years. Write a formula for the amount of material \( A(t) \) remaining after \( t \) years, given the original amount of \( A_0 \).

\[
\begin{align*}
(a) \quad A(t) &= A_0 t^{4500000000} \\
(b) \quad A(t) &= A_0 (0.5)^{t/4500000000} \\
(c) \quad A(t) &= A_0 t + 4500000000 \\
(d) \quad A(t) &= A_0 (4500000000)^t \\
(e) \quad \text{none of these}
\end{align*}
\]

13. Solve for \( t \) in the equation:

\[13e^{2t} = 3(5^t).\]