1. 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.

2. Write the equation $P = 1200(0.5)^t$ in the form $P = P_0 e^{kt}$. What is P_0 and what is k?

3. Suppose the table

x	0	1	2
y	48	72	108

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

4. 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.

(a) $\pi(q) = 600q - 65000$ (b) $\pi(t) = 2200q + 65000$

(c) $\pi(q) = 65000 + 600q$ (d) $\pi(t) = 65000 - 600q$

(e) none of these

5. Could the table

x	1990	1992	1994	1996	1998
y	1.38	1.23	1.10	0.95	0.80

represent a linear function?

(a) no (b) yes

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

$$
\begin{aligned}
(a) \quad & P(t) = 90(1.12)^t \\
(b) \quad & P(t) = 80(1.13)^t \\
(c) \quad & P(t) = 70(1.14)^t \\
(d) \quad & P(t) = 60(1.15)^t \\
(e) \quad & P(t) = 50(1.16)^t
\end{aligned}
$$

7. Let $f(x)$ and $g(x)$ be defined by the tables

x	0	1	2	3	4	5
$f(x)$	5	9	9	5	4	13

and

x	0	1	2	3	4	5
$g(x)$	4	14	13	8	5	4

Find $f(x) + 3g(x+1)$ when $x = 2$.

8. Compute the average rate of change for the function

$$f(x) = e^x \text{ over the interval } 0 \leq x \leq 2.$$

9. Every year a company decreases its research and development budget by 5%. How many years does it take for the budget to halve?

10. 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

11. Write the function

$y = (2x^{-2})^3$ as a power function in the form $y = kx^p$.

(a) $y = 8x^{-2}$ (b) $y = 2x^6$

(c) $y = 8x^2$ (d) $y = 2x^{-6}$

(e) none of these

12. Solve for t in the equation:

$$13e^{2t} = 3(5^t).$$

13. 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.

(a) $A(t) = A_0 t + 4500000000$ (b) $A(t) = A_0(4500000000)^t$

(c) $A(t) = A_0 t^{4500000000}$ (d) $A(t) = A_0(.5)^{t/4500000000}$

(e) none of these