

1) State the domain of each of the following functions.

a) $y = e^x$

b) $y = \log x$

2) According to one source, in 1984 there were approximately 1500 AIDS cases in California. By 1986 there were 4000 cases. Uncontrolled, a virus tends to spread exponentially. Assuming the virus were to spread uncontrolled,

a) Write an equation for the number of AIDS cases t years after 1984.

b) Describe your equation in words

c) According to your model, how many people would be infected in California now?

3) A population can be described by $P(t) = 200(1.05)^t$. What is the doubling time for this population?

4) Solve each of the equations below for x using algebra and properties of logarithms and exponents. Show all steps!

a) $4(1.7)^x = 7(1.08)^x$

b) $e^{x+5} = 7$

c) $\log(x + 3) = 3$

d) $\log(1-x) + \log(1+x) = 2$

5) A population doubles every 8 years. Assuming exponential growth, find the

a) Continuous growth rate

b) Annual growth rate

6) Determine whether each of the following tables represents a function that is concave up, concave down, both, or neither.

X	$f(x)$
1	15
2	8
3	5
4	3
5	2

x	$g(x)$
1	1
2	3
3	8
4	13
5	15

x	$h(x)$
1	-4
2	-1
3	2
4	5
5	8

7) Alex invests \$4000 in a money-market account earning 6% compounded monthly. Shauna invests \$2000 in a mutual fund earning 9% compounded quarterly. When will their accounts be worth the same amount?

8) Suppose the half-life of Kryptonite is 300 years. (give answers to 4 decimal places)

a) What is the annual decay rate?

b) What is the continuous decay rate?

9) Write the letter of the graph(s) that fit the description in the blank next to the following descriptions.

a. This/these graph(s) are increasing

b. This/these graph(s) are decreasing

c. This/these graph(s) are concave up

d. This/these graph(s) are concave down

e. This/these graph(s) are linear

f. This/these graph(s) are exponential

g. This/these graph(s) are logarithmic

