

CHAPTER 10

Exponential and Logarithmic Functions

10.1 Exponential Growth

1)

a)

X	$Y_1 = 3X$
0	0
1	3
2	6
3	9
4	12

X	$Y_2 = 3^X$
0	1
1	3
2	9
3	27
4	81

b) For $Y_1 = 3X$, each successive output is 3 added to the previous output.
For $Y_2 = 3^X$, each successive output is 3 times that of the previous output.

c) For $Y_1 = 3X$, the slope is constant: $m = 3$.
For $Y_2 = 3^X$, the slope is always increasing (at very fast pace).

d) For $Y_1 = 3X$, a constant slope indicates a linear relationship (straight line).
For $Y_2 = 3^X$, an increasing slope indicates the curve is getting steeper.

3)

a) (0, 1)

b) Increasing the base ($b > 1$) makes the graph steeper.

5) $f(x) = \frac{1}{3}(5)^x$

7)

a) $b = 1.5$

b) $f(x) = 5(1.5)^x$

9) $x = 4.97$

11) Daily compounding at the 5% interest rate yields more.

13) Approximately 7.2 yrs

15)

a) $A_0 = \$1000$

b) $r = 0.06 = 6\%$

c) $n = 12$

d) $1000(1 + 0.06/12)^{12 \cdot 4}$

17) $a = \frac{3}{256}$

19) $3(\frac{1}{2})^x$