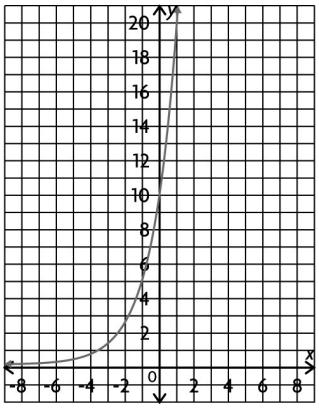
Chapter 7: Exponential and Logarithmic Functions

Lesson 7.1: Exploring the Characteristics of Exponential Functions, page 439

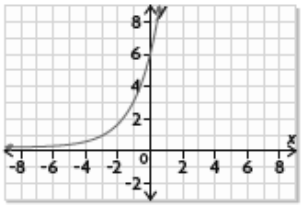
1. a) No, linear
b) Yes
c) No, quadratic
d) No, cubic
e) Yes
f) No, quadratic

2. b) No x-intercepts; y-intercept: $y = 1$
End behaviour: QII to QI
Domain: $\{x \mid x \in R\}$; Range: $\{y \mid y > 0, y \in R\}$
e) No x-intercepts; y-intercept: $y = 1$
End behaviour: QII to QI
Domain: $\{x \mid x \in R\}$; Range: $\{y \mid y > 0, y \in R\}$

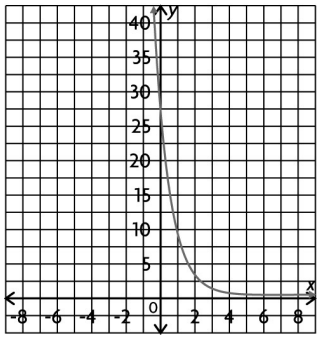
3. a) Number of x-intercepts: 0;
y-intercept: $y = 10$
Domain: $\{x \mid x \in R\}$; Range: $\{y \mid y > 0, y \in R\}$
End Behaviour: QII to QI



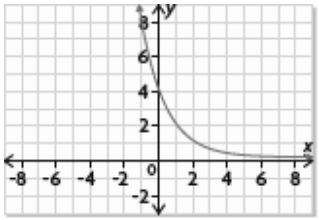
b) Number of x-intercepts: 0
y-intercept: $y = 6$
Domain: $\{x \mid x \in R\}$
Range: $\{y \mid y > 0, y \in R\}$
End Behaviour: QII to QI



c) Number of x-intercepts: 0
y-intercept: $y = 27$
Domain: $\{x \mid x \in R\}$; Range: $\{y \mid y > 0, y \in R\}$
End Behaviour: QII to QI



d) Number of x-intercepts: 0
y-intercept: $y = 4$
Domain: $\{x \mid x \in R\}$
Range: $\{y \mid y > 0, y \in R\}$
End Behaviour: QII to QI



Lesson 7.2: Relating the Characteristics of an Exponential Function to Its Equation, page 448

1. a)

Term	First Difference	Second Difference
14 – 7	7	
28 – 14	14	7
56 – 28	28	14
112 – 56	56	28
224 – 112	112	56

I noticed that the difference between consecutive y-values doubles from one pair of values to the next. I know that there must be a base value of 2 being raised to an exponent and then multiplied by some constant term in the equation. The equation looks like $y = a(2^x)$. Thus, the answer is yes, because for each unit increase in x, the value of y doubles.

b)

Term	First Difference	Second Difference
3072 – 768	2304	
768 – 192	576	1728
192 – 48	144	432
48 – 12	36	108
12 – 3	9	27

I noticed that the difference between consecutive y-values is not constant. The function is not linear.