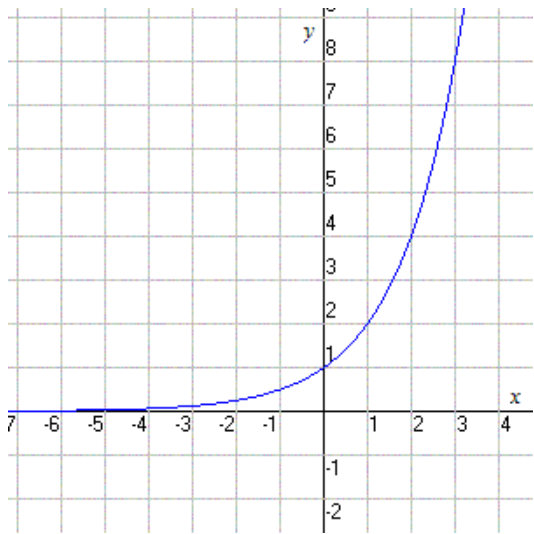(a) Determine whether the following are linear, exponential, or neither.
(b) Determine whether each relationship is continuous or discrete
(c) Determine the domain and write it in set notation

1.

2.

Rounds	1	2	3	4	5
Number of players left	64	32	16	8	4

3. $f(x) = 2(5)^x$

4. $f(x) = 4x + 3$

5.

| x	f(x)
3	-9
-7	-7
-2	-8
13	-11

6.
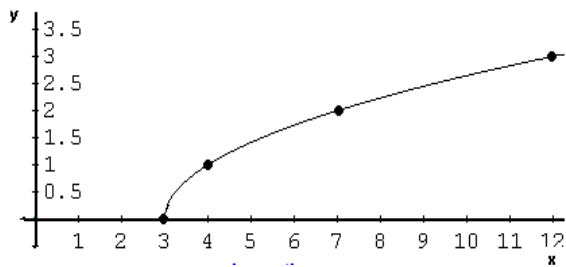
7.

x	f(x)
1	3
2	6
6	96
8	384

8. A water purification plant just installed a new pump that cleanses 4 gallons of water per minute. Suppose the plant already had 500 gallons of pure water when they replaced the pump and that the pump runs all day every day.

    a) Create a table that represents this situation. Make sure you label your table.

    b) Create a graph that represents this situation. Make sure you label your graph.
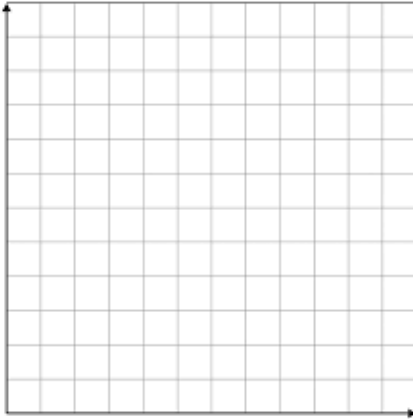
c) Write an explicit function to show the gallons of pure water available after x minutes.

d) How does each part of your function in part (c) connect to the story problem?

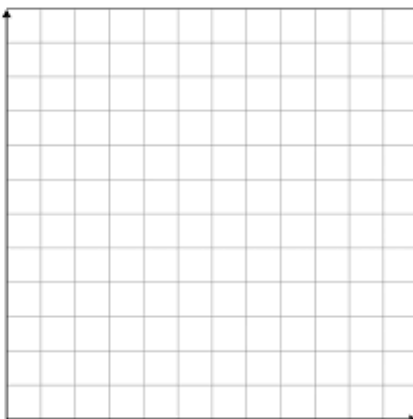   e) Is the relationship shown above linear or exponential?

    f) Is the relationship shown above discrete or continuous?

    g) Is the relationship a sequence? Why or why not? If so, is it a geometric or arithmetic sequence?

9. A sequence that starts with 2 and has a constant ratio that increases by 75% each term.

    a) Create a table to model this situation.

    b) Create a graph to model this situation.

c) Create an explicit function for this situation.

d) How does each part of your function in part (c) connect to the story problem?

e) Is the relationship linear or exponential?

f) Is the relationship discrete or continuous?

g) What type of sequence is the relationship above?

Determine whether the following relationships are linear, exponential, or neither. State the slope if linear or constant ratio if exponential.

10. $y = \frac{3}{4}x + 5$

13. $f(0) = 2, f(n) = f(n-1) \cdot 5$

11. $2x + 5y = 10$

14. $y - 7 = 3(x - 2)$

12. $y = 2 \cdot 5^{x-1}$

15. $f(0) = 2, f(n) = f(n-1) - \frac{2}{5}$

16.

x	$f(x)$
-1	2
1	4
4	6
5	8
9	10

17.

x	$f(x)$
0	3
1	6
3	24
7	384
9	1536

18.

x	$f(x)$
0	-6
1	-12
2	-24
4	-48
6	-96

Let $f(x) = 4(6)^x$ and $g(x) = 7x - 10$

19. Is $f(x)$ linear or exponential? Create a table for $f(x)$ below:

x	f(x)
0	
1	
2	
3	

20. Is $g(x)$ linear or exponential? Create a table for $g(x)$ below:

x	g(x)
0	
1	
2	
3	

21. On the graph shown below, create an increasing linear and an increasing exponential function.
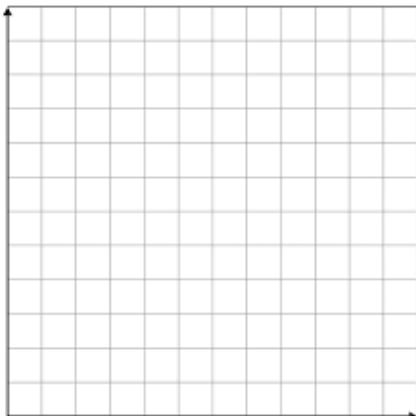
22. Which relationship, out of linear or exponential, will have a greater rate of change in the long run?