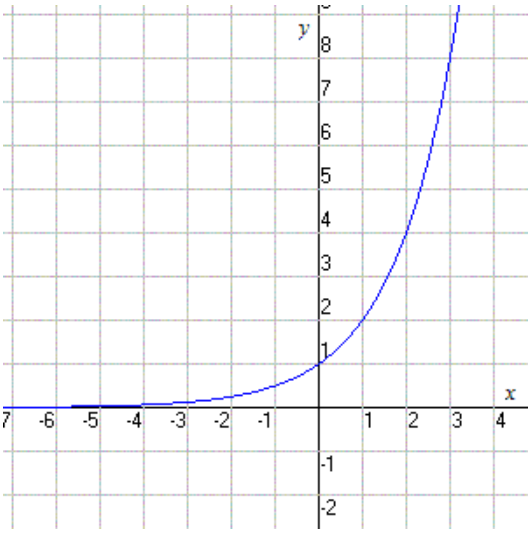
Name: _____ Period:_____

# Mod 4 Test Review

(a) Determine whether the following are linear, exponential, or neither.
(b) Determine whether each relationship is continuous or discrete
(c) Determine the domain and range of each relationship

1.

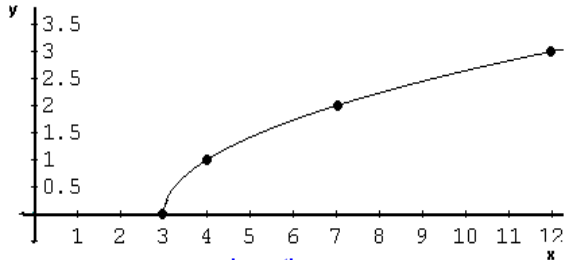



2.

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

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

4




5.

$y = 4x + 3$

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5. 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

b) Create a graph

c) Create an explicit function

d) Explain each piece of your function in part (c)

e) Is the relationship linear or exponential?

Name: _____ Period:_____

f) Is the relationship discrete or continuous?

g) Is the relationship a sequence? Why or why not? If so, what type?

6. When Facebook was founded it had three initial users. Now, since so many people use Facebook, they use computers to calculate the total users. At the end of each month, at midnight, the computers determine the number of users. Looking back on past data, they've noticed that the number of users increased by 75% each month.

a) Create a table

b) Create a graph

c) Create an explicit function

d) Explain each piece of your function in part (c)

e) Is the relationship linear or exponential?

f) Is the relationship discrete or continuous?

g) Is the relationship a sequence? Why or why not? If so, what type?

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Match the equations and functions in the first column with the equivalent equation in the second column.

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

8. $2x + 5y = 10$

9. $y = 2 \cdot 5^x$

10. $f(x) = 3 \cdot 4^{x-1}$

11. $6x + 3y = 18$

12. $f(x) = 3x + 1$

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

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

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

d. $y = -2x + 6$

e. $y - 8 = \frac{3}{4}(x - 4)$

f. $f(1) = 3, f(n) = f(n-1) \cdot 4$

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13. What are the requirements for a relationship to be a sequence?

Name: _____ Period:_____

14. Determine whether the following relationships are sequences or not. If so, state what type.

(a)

| x | F(x) |
|---|---|
| -2 | 3 |
| -1 | 5 |
| 0 | 7 |
| 1 | 9 |
| … | … |

(b)

| x | F(x) |
|---|---|
| 0 | 3 |
| 0.5 | 8 |
| 1 | 13 |
| 1.5 | 18 |
| … | … |

(c)

| x | F(x) |
|---|---|
| 0 | 3 |
| 1 | 12 |
| 2 | 21 |
| 3 | 30 |
| … | … |

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

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

| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

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

| x | g(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

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17. Create a graph that fits the following descriptions to help you answer #18 below.

| (A) Create a graph with both a linear increasing function, and an exponential increasing function: | (B) Create a graph with both a linear increasing function, and an exponential decreasing function: | (A) Create a graph with both a linear decreasing function, and an exponential decreasing function: |
|---|---|---|
| | | |

18. Which relationship, out of linear or exponential, will have a greater output in the long run?

Name: _____ Period:_____

19. Determine whether the following relationships are linear, exponential, or neither.

(a)

| $x$ | $f(x)$ |
|---|---|
| -1 | 4 |
| 1 | 8 |
| 4 | 2 |
| 5 | 6 |
| 9 | 30 |

(b)

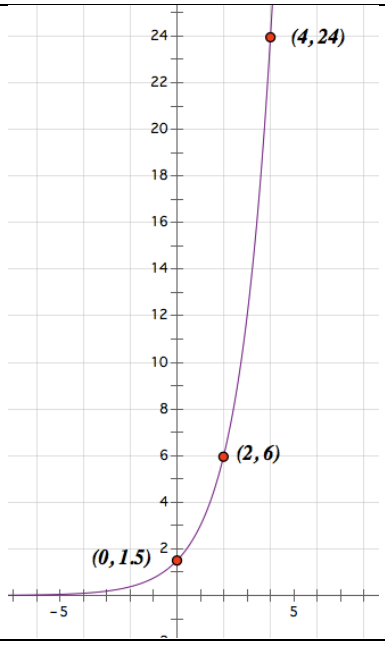
| $x$ | $f(x)$ |
|---|---|
| 0 | 3 |
| 1 | 6 |
| 3 | 24 |
| 7 | 384 |
| 9 | 1536 |

(c)

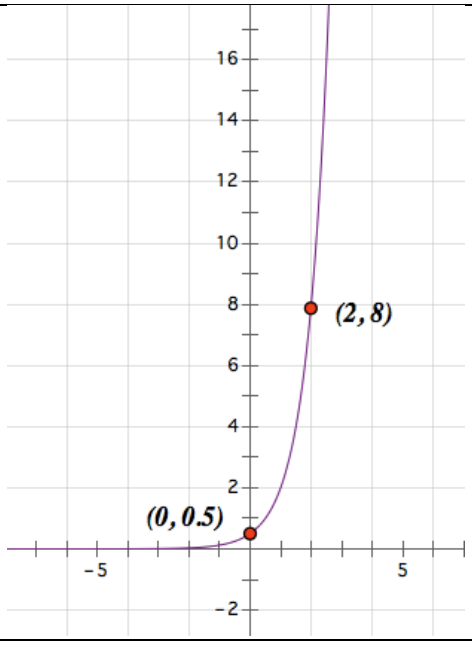
| $x$ | $f(x)$ |
|---|---|
| 0 | -6 |
| 1 | -12 |
| 2 | -24 |
| 4 | -48 |
| 6 | -96 |

# Mod 4 Honors Review

19. Write the equation of *f(x)* shown in the graph below.
   a) Then find the average rate of change of *f(x)* when x is between 1 and 4.
   b) Draw in the secant line (the line that you are finding the slope of when x is between 1 and 4).




20. Write the equation of *g(x)* shown in the graph below.
   a) Then find the average rate of change of *g(x)* when x is between 0 and 2.
   b) Draw the secant line (the line that you are finding the slope of when x is between 0 and 2).




21. Let $h(x) = 3 \cdot 7^x$ and find the average rate of change of *h(x)* when x is between and -1 and 5.