Algebra I

Name Key

Review – Rate of Change, Exponential Functions, Sequences and Transformations.

① What is the rate of change for $f(x) = -5x + 3$ over the interval $[2, 8]$?

-5

② Given: $f(x) = (x-1)^2 + 3$

Find Rate of Change over the interval $[2, 5]$.

7.5

③ Given: $f(x) = -5.2x + 1$ over $[10, 20]$.

-5.2

④ If $g(x)$ is a Vertical translation 6 units up of $f(x) = 7x + 1$, what is the rule for $g(x)$?

$g(x) = 7x + 7$

⑤ If $g(x)$ is a Vertical translation 10 units down of $f(x) = 6x + 1$, what is the rule for $g(x)$?

$g(x) = 6x - 9$

⑥ Describe the transformation:

$y = -\frac{1}{3}x + 2$

- Reflection
- Shrink by $\frac{1}{3}$
- Vertical Shift up 2.

⑦ Given:

$g(x)$: $f(x) = \frac{1}{2}x + 3$

x	y
-1	-1
0	2
1	5

$g(x)$ – Which has greater Rate of Change?

$f(x)$ – Which has greater y-intercept?

⑧ Given:

12, 22, 32, 42, ...

Write the Recursive Form & Explicit Form.

Recursive: $a_n = a_{n-1} + 10$

Explicit: $a_n = 12 + 10(n-1)$

⑨ Given:

$a_n = 17 + 2(n-1)$

Find:

$a_1 = 17$

$a_{20} = 55$

⑩ Given the Sequence

7, 13, 19, 24, ...

Assuming the pattern continues, Write a function for the n^{th} term.

$a_n = 7 + 6(n-1)$

⑪ If $a_n = a_{n-1} + 5$ and $a_7 = 15$, what is a_{10}?

$a_{10} = 30$

⑫

hours	10	15	17	23
Salary	160	235	265	355

What is the average rate of change from hours 15 to 23?

15

(13) The explicit formula for a geometric sequence is $a_n = 4(-3)^{n-1}$. What is the 5th term of the sequence?

$a_5 = 324$

(14) Given $f(x) = 3^x$

Find:

Domain: All Real #'s

Range: $y > 0$

$a = \frac{1}{1}$

$b = \frac{3}{1}$

Increasing or Decreasing

(15)

x	3	2	1	0	
y	2	1	½	¼	⅛

Which is the equation:

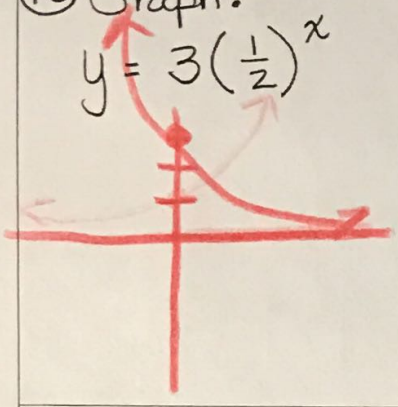
(A) $f(x) = (\frac{1}{4})^x$

(B) $f(x) = 3^x$

(C) $f(x) = \frac{1}{4} \cdot 2^x$

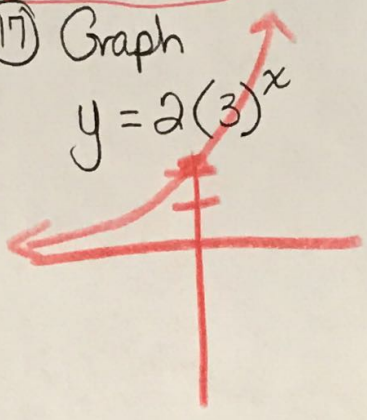
(16) Graph:

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



(17) Graph

$y = 2(3)^x$



(18) The explicit formula for a geometric sequence is $a_n = 15(2)^{n-1}$, What is the 8th term?

$a_8 = 1920$

(19) Describe the transformation:

$y = 3x + 5$

- Stretch by factor of 3
- Vertical Shift up 5 units

(20) If $a_n = a_{n-1} - 2$ and $a_3 = -7$, find a_5.

$a_5 = -11$

(21) $y = (\frac{1}{4})^x$

Find:

Domain: All Real #

Range: $y > 0$

$a = \frac{1}{1}$

$b = \frac{1/4}{1}$

Increasing or Decreasing