Algebra 1 Name: **Answer Key**
Unit 10 Day 4 – Quiz Review

1) For the tables below, determine if each table represents a linear, quadratic, or exponential function. If the table represents an exponential function, write the exponential function that it represents.

x	y
-2	-4
-1	-1
0	2
1	5
2	8

Linear

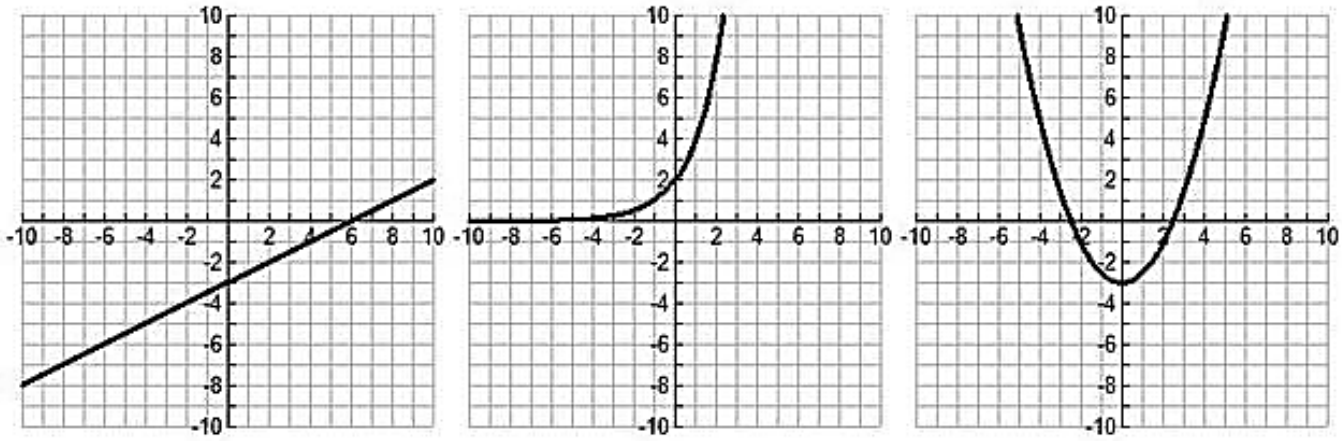
x	y
0	4
1	12
2	36
3	108
4	324

Exponential → $y = 4(3)^x$

x	y
-2	-4
-1	-1
0	2
1	5
2	8

Linear

2) For the graphs below, determine if each graph represents a linear, quadratic, or exponential function. If the graph represents an exponential function, write the exponential function that it represents.



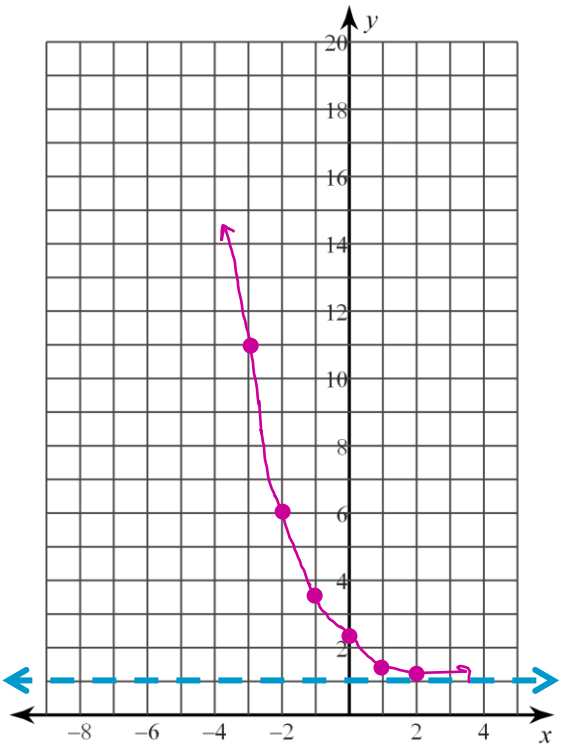
Linear **Exponential → $y = 2(2)^x$** **Quadratic**

3) For the equations below, determine if each equation represents a linear, quadratic, or exponential function. If the equation represents an exponential function, determine whether it is an example of exponential growth or exponential decay.

$y = 6x + 3$	$y = 4^{x-2} + 1$	$y = (x+1)^2$	$y = x^2 - 3$	$y = \frac{1}{2} \cdot \frac{8^x}{3}$
Linear	**Exponential Growth**	**Quadratic**	**Quadratic**	**Exponential Growth**

4) Graph the following exponential function. Then, identify the specified characteristics.

$$y = 5 \cdot \left(\frac{1}{2}\right)^{x+2} + 1$$



Domain: $-\infty < x < \infty$

or **all real numbers**

Range: $1 < y < \infty$

or $y > 1$

X-Intercept(s): **none**

Y-Intercept: $(0, 2.25)$

Zero(s): **none**

Interval of Increase/Decrease/Constant *(circle one before identifying):*

$-\infty < x < \infty$ **(all real #s)**

x	y
- 3	11
- 2	6
- 1	3.5
0	2.25
1	1.63
2	1.31
3	1.16

Maximum: **none** Minimum: **none**

Asymptote: $y = 1$

As x → -∞, f(x) → ∞. As x → ∞, f(x) → 1.

Positive: $-\infty < x < \infty$ Negative: **none**

(or all real numbers)

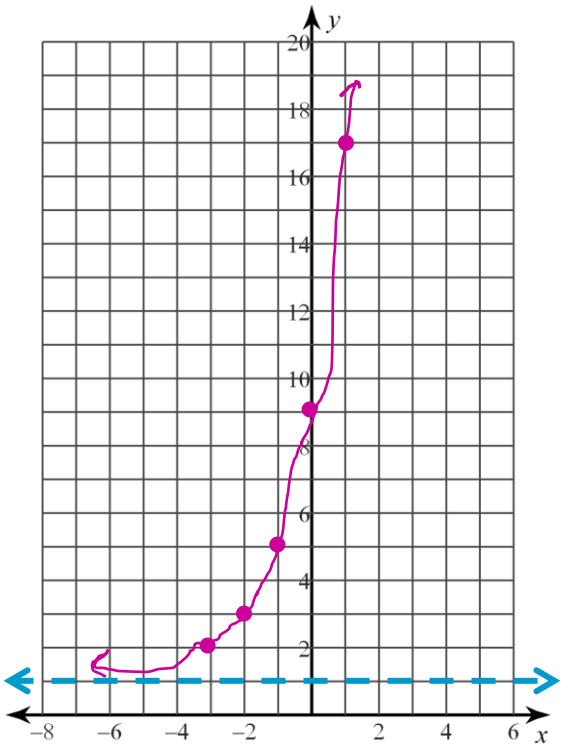
Exponential growth or decay? *(circle one)*

Find the average rate of change over the interval $-3 < x < 0$

$(-3, 11)(0, 2.25)$ AROC = -2.92

5) Graph the following exponential function. Then, identify the specified characteristics.

$y = 4 \cdot 2^{x+1} + 1$



Domain: $-\infty < x < \infty$

or **all real numbers**

Range: $1 < y < \infty$

or $y > 1$

X-Intercept(s): **none**

Y-Intercept: $(0, 9)$

Zero(s): **none**

Interval of Increase/Decrease/Constant *(circle one before identifying):*

$-\infty < x < \infty$ **(all real #s)**

x	y
- 3	
- 2	
- 1	
0	
1	
2	
3	

Maximum: **none** Minimum: **none**

Asymptote: $y = 1$

As x → -∞, f(x) → **1**. As x → ∞, f(x) → **∞**.

Positive: $-\infty < x < \infty$ Negative: **none**

(or all real numbers)

Exponential growth or decay? *(circle one)*

Find the average rate of change over the interval $-3 < x < 0$

$(-3, 2)(0,9)$ AROC = $\frac{7}{3}$

6) Identify the transformations for each function below. Then, identify the y-intercept and asymptote when asked.

a) $f(x) = \frac{3}{4}(3)^{x+1} - 2$

$a = \frac{3}{4}$ vertical shrink of $\frac{3}{4}$

$b = 3$

$h = -1$ translation left 1

$k = -2$ translation down 2

asymptote: $\boldsymbol{y = -2}$

b) $y = -5^x + 4$

$a = -1$ reflection over x-axis

$b = 5$

$h = 0$

$k = 4$ translation up 4

y-intercept: $(0,3)$

c) $f(x) = -0.8(2)^{x-4}$

$a = -0.8$ reflection over x-axis; vertical shrink of 0.8

$b = 2$

$h = 4$ translation right 4

$k = 0$

asymptote: $\boldsymbol{y = 0}$

d) $y = (0.5)^x + 8$

$a = 1$

$b = 0.5$

$h = 0$

$k = 8$ translation up 8

y-intercept: $(0,9)$

7) Using the parent function $f(x) = 3^x$, write a new function that has the following transformations:

- Reflection over x-axis → a
- Translation down 2 → k
- Vertical shrink of $\frac{1}{2}$ → a
- Translation right 6 → h

$$y = -\frac{1}{2}(3)^{x-6} - 2$$

8) Using the function $f(x) = 1.5(4)^x + 3$, find the rate of change over the interval $0 < x < 1$.

$f(0) = 1.5(4)^0 + 3 = 4.5 \rightarrow (0, 4.5)$

$f(1) = 1.5(4)^1 + 3 = 9 \rightarrow (1, 9)$

AROC = 4.5