2.2 Change in Linear and Exponential Functions
AP Precalculus   Name: _____

A function has the following coordinate points. Could the function represent a linear function, exponential function, or neither?

| 1. $(-2, 5), (-1, 8), (0, 11)$ | 2. $(8, 10), (9, 12), (10, 8)$ | 3. $(2, 12), (3, 6), (4, 3)$ |

The following functions are either linear or exponential. Which is it? Justify your answer.

4.

x	-3	2	7
$f(x)$	1	3	9

5.

x	2	6	10
$f(x)$	12	9	6

Is each function linear or exponential. Identify the constant (slope or ratio) that causes the output values to change?

| 6. $y = -4 \cdot \left(\frac{1}{3}\right)^x$ | 7. $y = 6 + 2x$ | 8. $y = 8 \cdot 3^{x+6}$ | 9. $y + 1 = 6\left(x - \frac{2}{3}\right)$ |

It is known that $f(x)$ is a linear function and that it passes through the given points. Write an equation for this function.

| 10. $(8, 12)$ and $(10, 6)$ | 11. $(3, 5)$ and $(8, 40)$ |

It is known that $f(x)$ is an exponential function and that it passes through the given points. Write an equation for this function.

12. $(8, 12)$ and $(10, 6)$	13. $(3, 5)$ and $(8, 40)$

Answers to 2.2 CA #1

1. linear	2. neither	3. exponential	4. Exponential because for each input change of 5, f changes proportionally by a ratio of 3.	
5. Linear because for each input change of 4, f changes at a constant rate -3.	6. Ratio of $\frac{1}{3}$	7. Slope of 2	8. Ratio of 3	9. Slope of 6
10. $y - 12 = -3(x - 8)$ or $y - 6 = -3(x - 10)$	11. $y - 5 = 7(x - 3)$ or $y - 40 = 7(x - 8)$	12. $y = 12 \cdot \left(\sqrt{\frac{1}{2}} \right)^{x-8}$ or $y = 6 \cdot \left(\sqrt{\frac{1}{2}} \right)^{x-10}$	13. $y = 5 \cdot \left(\sqrt[5]{8} \right)^{x-3}$ or $y = 40 \cdot \left(\sqrt[5]{8} \right)^{x-8}$	