

Name: KEY

Date: \_\_\_\_\_

1. Consider the following set of data:

x	y
1	13.08
2	20.97
3	28.86
4	36.75
5	44.64
6	52.53

$$a_0 = 13.08 - 7.89$$

$$a_0 = 5.19$$

Fill out the following table:

Differences	
Between 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$20.97 - 13.08 = 7.89$
Between 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$28.86 - 20.97 = 7.89$
Between 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$36.75 - 28.86 = 7.89$
Between 4 <sup>th</sup> and 5 <sup>th</sup> terms	$44.64 - 36.75 = 7.89$
Between 5 <sup>th</sup> and 6 <sup>th</sup> terms	$52.53 - 44.64 = 7.89$

Ratios	
Of 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$\frac{13.08}{20.97} = 0.62$
Of 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$\frac{20.97}{28.86} = 1.38$
Of 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$\frac{28.86}{36.75} = 1.27$
Of 4 <sup>th</sup> and 5 <sup>th</sup> terms	$\frac{36.75}{44.64} = 1.21$
Of 5 <sup>th</sup> and 6 <sup>th</sup> terms	$\frac{44.64}{52.53} = 1.18$

2. Would the data best be modeled by a linear function or an exponential function? How do you know?

Linear function because there is a common difference.

3. Write a recursive formula for the data:

$$a_n = a_{n-1} + d, a_0 = \underline{\hspace{2cm}}$$

$$a_n = a_{n-1} + 7.89, a_1 = 13.08$$

4. Write an explicit formula for the data:

$$a_n = dn + a_0 \text{ or } a_n = d(n-1) + a_1$$

$$a_n = 7.89n + 5.19$$

5. Consider the following set of data:

x	y
1	7.3
2	8.76
3	10.512
4	12.614
5	15.137
6	18.165

$$a_0 = 7.3 \div 1.2 = 6.083$$

Fill out the following table:

Differences	
Between 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$8.76 - 7.3 = 1.46$
Between 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$10.512 - 8.76 = 1.752$
Between 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$12.614 - 10.512 = 2.102$
Between 4 <sup>th</sup> and 5 <sup>th</sup> terms	$15.137 - 12.614 = 2.523$
Between 5 <sup>th</sup> and 6 <sup>th</sup> terms	$18.165 - 15.137 = 3.028$

Ratios	
Of 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$\frac{8.76}{7.3} = 1.2$
Of 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$\frac{10.512}{8.76} = 1.2$
Of 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$\frac{12.614}{10.512} = 1.2$
Of 4 <sup>th</sup> and 5 <sup>th</sup> terms	$\frac{15.137}{12.614} = 1.2$
Of 5 <sup>th</sup> and 6 <sup>th</sup> terms	$\frac{18.165}{15.137} = 1.2$

6. Would the data best be modeled by a linear function or an exponential function? How do you know?

Exponential function because there is a common ratio.

7. Write a recursive formula for the data:

$$a_n = r(a_{n-1}), a_0 = \underline{\hspace{2cm}}$$

$$a_n = 1.2a_{n-1}, a_1 = 7.3$$

8. Write an explicit formula for the data:

$$a_n = a_0(r)^n \text{ or } a_n = a_1(r)^{n-1}$$

$$a_n = 6.083(1.2)^n \text{ or } a_n = 7.3(1.2)^{n-1}$$

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9. Consider the following set of data:

x	y
1	180
2	135
3	94.5
4	68.99
5	51.05
6	36.76

Fill out the following table:

Differences	
Between 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$135 - 180 = -45$
Between 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$94.5 - 135 = -40.5$
Between 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$68.99 - 94.5 = -25.51$
Between 4 <sup>th</sup> and 5 <sup>th</sup> terms	$51.05 - 68.99 = -17.94$
Between 5 <sup>th</sup> and 6 <sup>th</sup> terms	$36.76 - 51.05 = -14.29$

Ratios	
Of 1 <sup>st</sup> and 2 <sup>nd</sup> terms	$\frac{135}{180} = 0.75$
Of 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	$\frac{94.5}{135} = 0.7$
Of 3 <sup>rd</sup> and 4 <sup>th</sup> terms	$\frac{68.99}{94.5} = 0.73$
Of 4 <sup>th</sup> and 5 <sup>th</sup> terms	$\frac{51.05}{68.99} = 0.74$
Of 5 <sup>th</sup> and 6 <sup>th</sup> terms	$\frac{36.76}{51.05} = 0.72$

10. Would the data best be modeled by a linear function or an exponential function? How do you know?

neither. there is no common difference or ratio.  
(though the ratios are close)

11. Write a recursive formula for the data:

n/a

12. Write an explicit formula for the data:

n/a

13. Consider the following set of data:

x	y
1	45.9
2	42.2
3	38.62
4	35.19
5	31.69
6	28.08

Fill out the following table:

Differences	
Between 1 <sup>st</sup> and 2 <sup>nd</sup> terms	-3.7
Between 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	-3.58
Between 3 <sup>rd</sup> and 4 <sup>th</sup> terms	-3.43
Between 4 <sup>th</sup> and 5 <sup>th</sup> terms	-3.5
Between 5 <sup>th</sup> and 6 <sup>th</sup> terms	-3.61

Ratios	
Of 1 <sup>st</sup> and 2 <sup>nd</sup> terms	0.92
Of 2 <sup>nd</sup> and 3 <sup>rd</sup> terms	0.92
Of 3 <sup>rd</sup> and 4 <sup>th</sup> terms	0.91
Of 4 <sup>th</sup> and 5 <sup>th</sup> terms	0.90
Of 5 <sup>th</sup> and 6 <sup>th</sup> terms	0.89

14. Would the data best be modeled by a linear function or an exponential function? How do you know?

neither – no common difference/ratio  
(though its very close to both)

15. Write a recursive formula for the data:

n/a

16. Write an explicit formula for the data:

n/a