Lesson 1

READY, SET, GO! Name Key Period Date

READY

Topic: Comparing Additive and Multiplicative Patterns

The sequences below exemplify either an additive (arithmetic) or a multiplicative (geometric) pattern. Identify the type of sequence, fill in the missing values on the table and write an equation.

1.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	2	4	8	16	32	64	128	256

a. Type of Sequence: Geometric (Exponential)

b. Equation: $y = 2(2)^{x-1}$ or $y = 2^x$

2.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	66	50	34	18	2	-14	-30	-46

(−16, −16, −16)

a. Type of Sequence: Arithmetic (Linear)

b. Equation: $y = -16x + 82$ or $y = 66 - 16(x-1)$

3.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	-3	9	-27	81	-243			

a. Type of Sequence: Geometric (Exponential)

b. Equation: $y = -3(-3)^{x-1}$ or $y = 1(-3)^x$

4.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	160	80	40	20	10	5	2.5	1.25

($\cdot\frac{1}{2}$, $\cdot\frac{1}{2}$)

a. Type of Sequence: Geometric (Exponential)

b. Equation: $y = 160(\frac{1}{2})^{x-1}$ or $y = 320(\frac{1}{2})^x$

5.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	-9	-2	5	12	19	26	33	40

(+7, +7, +7)

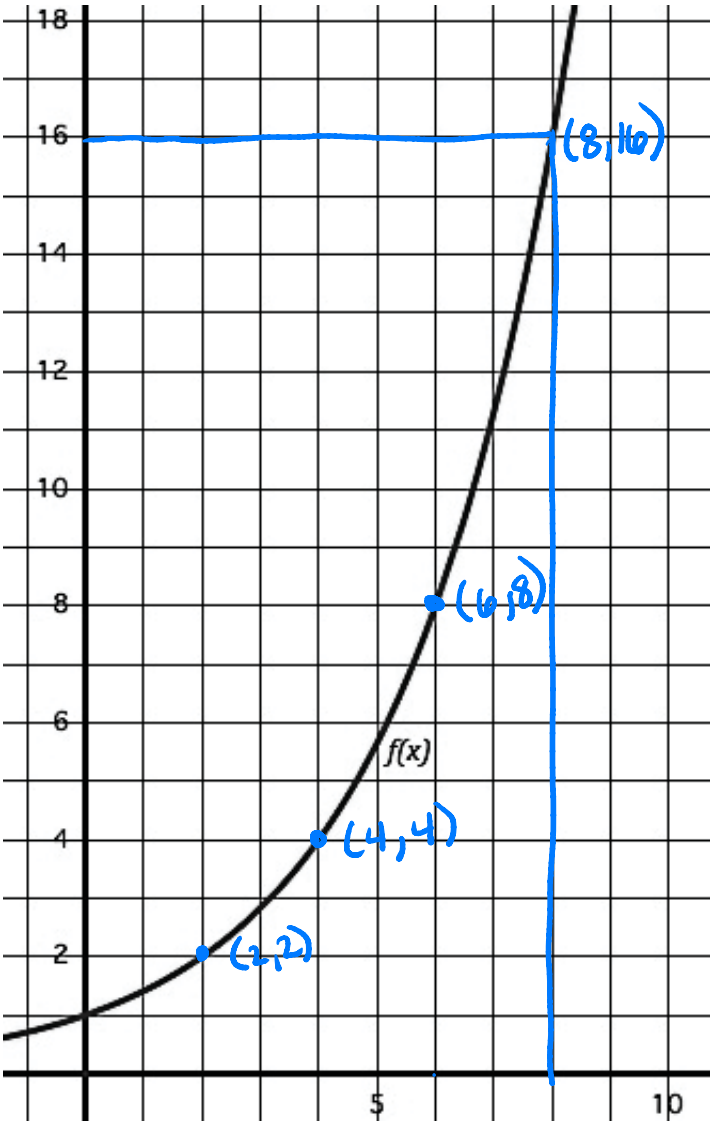
a. Type of Sequence: Arithmetic (Linear)

b. Equation: $y = 7x - 16$ or $y = -9 + 7(x-1)$

Need help? Visit **www.rsgsupport.org**

Lesson 1

Use the graph of the function to find the desired values of the function. Also create an explicit equation for the function.



6. Find the value of $f(2)$ = 2

7. Find where $f(x) = 4$

$f(4) = 4$

$x = 4$

8. Find the value of $f(6)$ = 8

9. Find where $f(x) = 16$

$f(8) = 16$

$x = 8$

10. What do you notice about the way that inputs and outputs for this function relate? (Create an in-out table if you need to.)

x	f(x)
0	1
2	2
4	4
6	8
8	16

+2, ×2

Double every 2 units.

11. What is the explicit equation for this function?

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

SET

Topic: Evaluate the Expressions with Rational Exponents

Fill in the missing values of the table based on the growth that is described.

12. The growth in the table is triple at each whole year.

Years	0	$\frac{1}{2}$	1	$\frac{3}{2}$	2	$\frac{5}{2}$	3	$\frac{7}{2}$	4
bacteria	2	$2\sqrt{3}$	6	$6\sqrt{3}$	18	$18\sqrt{3}$	54	$54\sqrt{3}$	162

13. The growth in the table is triple at each whole year.

Years	0	$\frac{1}{3}$	$\frac{2}{3}$	1	$\frac{4}{3}$	$\frac{5}{3}$	2	$\frac{7}{3}$	$\frac{8}{3}$
bacteria	2	$2\sqrt[3]{3}$	$2\sqrt[3]{3^2}$	6	$6\sqrt[3]{3}$	$6\sqrt[3]{3^2}$	18	$18\sqrt[3]{3}$	$18\sqrt[3]{3^2}$

14. The values in the table grow by a factor of four at each whole year.

Years	0	$\frac{1}{2}$	1	$\frac{3}{2}$	2	$\frac{5}{2}$	3	$\frac{7}{2}$	4
bacteria	2	4	8	16	32	64	128	256	512

$y = 2(4)^x$

GO

Topic: Simplifying Exponents

Simplify the following expressions using exponent rules and relationships, write your answers in exponential form. (For example: $2^2 \cdot 2^5 = 2^7$)

15. $3^2 \cdot 3^5$ $= 3^7$

16. $\frac{5^3}{5^2} = 5$

17. $2^{-5} = \frac{1}{2^5} = \frac{1}{32}$

18. $17^0 = 1$

19. $\frac{7^5}{7^2} \cdot \frac{7^3}{7^4}$ $\frac{7^3}{7} = 7^2 = 49$

20. $\frac{3^2 \cdot 3^5}{3^7 3^2} = \frac{3^5}{3^9} = \frac{1}{3^4} = \frac{1}{81}$