

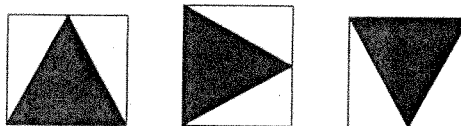
1. Pauline's Pizza Shop made 16 pizzas on Monday, 22 pizzas on Tuesday, and 28 pizzas on Wednesday. If this pattern continues, how many pizzas will Pauline's Pizza Shop make on Friday?
 $16 + 6 = 22$ $22 + 6 = 28$ $28 + 6 = 34$ $34 + 6 = 40$ pizzas
 Mon Tues Wed Thurs Fri Add 6 more pizzas each day
2. Consider the sequence shown. 4, 12, 36, 108, 324, 972

a. Describe the pattern. *Multiply by 3*

b. What is the next number in the pattern?

$$972 \times 3 = 2916$$

3. Consider the sequence shown.



a. Describe the pattern.

The figure rotates 90° clockwise.

b. Draw the next two figures of the pattern.



4. Write the first 4 terms of each sequence.

a. an arithmetic sequence with a common difference of 7 and a first term of -12

$$-12, -5, 2, 9 \quad d = 7$$

add 7 to each number

b. a geometric sequence with a common ratio of 0.1 and a first term of 100

$$100, 10, 1, 0.1 \quad r = 0.1$$

multiply by 0.1

c. an arithmetic sequence with a common difference of -0.25 and a first term of 5

$$5, 4.75, 4.5, 4.25 \quad d = -0.25$$

add -0.25

d. a geometric sequence with a common ratio of 2 and a first term of $\frac{1}{3}$

$$\frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{8}{3} \quad r = 2$$

multiply by 2

5. Identify each sequence as arithmetic or geometric. Then determine the common difference or common ratio for each sequence.

a. 5, 3.5, 2, 0.5, -1 *Arithmetic*
 $3.5 - 5 = -1.5$
 $2 - 3.5 = -1.5$ $d = -1.5$

b. 1, 6, 36, 216, 1296 *Geometric*
 $\frac{6}{1} = 6$ $\frac{36}{6} = 6$ $r = 6$

c. -19, -13, -7, -1, 5
 $-13 - (-19) = -13 + 19 = 6$ *Arithmetic*
 $-7 - (-13) = -7 + 13 = 6$ $d = 6$

d. $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \frac{1}{64}$ *Geometric*
 $\frac{\frac{1}{8}}{\frac{1}{4}} = \frac{1}{8} \times \frac{4}{1} = \frac{1}{2}$ $r = \frac{1}{2}$

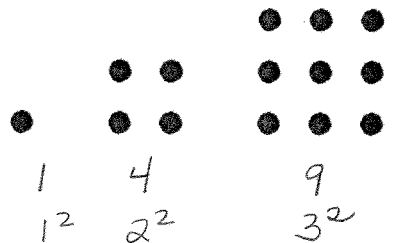
6. ^①Bradley makes ^②two phone calls to his friends to tell them school is cancelled because of snow. Each of those friends makes ^④two calls to tell their friends the same news. Each of those friends makes ^⑧two calls to tell their friends the same news, and so on.

a. Write a numeric sequence to represent the number of calls made in each of the first 5 sets of phone calls. $1, 2, 4, 8, 16, \dots$

b. Is this an arithmetic or geometric sequence?

Geometric
 $r = 2$
 Multiply by 2

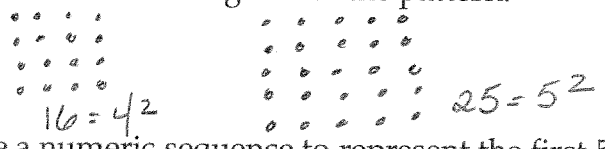
7. Consider the sequence shown.



a. Describe the pattern.

Perfect squares

b. Draw the next two figures of the pattern.



c. Write a numeric sequence to represent the first 5 figures.

$1, 4, 9, 16, 25$

8. Determine if the sequence is arithmetic or geometric. Identify the next term in the sequence.

$0.4, 0.08, 0.016, 0.0032, \dots$

$\frac{0.08}{0.4} = 0.2$ $\frac{0.016}{0.08} = 0.2$

Geometric, $r = 0.2$

$0.4, 0.08, 0.016, 0.0032, 0.00064$

9. What is the common difference in the sequence $-40, -12, 16, 44, \dots$?

$-12 - (-40) = -12 + 40 = 28$ $d = 28$
 $16 - (-12) = 16 + 12 = 28$

10. The Robinsons are draining their family swimming pool. After one-half hour, there are 7500 gallons of water in the pool. After one hour, there are 7200 gallons of water in the pool. After one and one-half hours, there are 6900 gallons of water in the pool. If this pattern continues, how much water will be in the pool after 3 hours?

7500	-300	7200	-300	6900	-300	6600	-300	6300	-300	6000
$\frac{1}{2}$		1		$1\frac{1}{2}$		2		$2\frac{1}{2}$		3

6000 gallons of water
 after 3 hours

Decide whether each sequence is arithmetic or geometric. Then use the appropriate formula to determine each term.

$$a_n = a_1 + d(n-1)$$

$$g_n = g_1 \cdot r^{n-1}$$

11. Determine the 20th term of the sequence
30, 70, 110, ...

$$70 - 30 = 40$$

$$110 - 70 = 40$$

Arithmetic

$$d = 40$$

$$a_{20} = 30 + 40(20-1)$$

$$a_{20} = 30 + 40(19)$$

$$a_{20} = 30 + 760$$

$$a_{20} = 790$$

13. Determine the 12th term of the sequence
-5, 20, -80, 320, ...

$$20 / -5 = -4$$

$$-80 / 20 = -4$$

Geometric

$$r = -4$$

$$g_{12} = -5 \cdot (-4)^{12-1}$$

$$g_{12} = -5 \cdot (-4)^{11}$$

$$g_{12} = -5(-4194304)$$

$$g_{12} = 20971520$$

15. Determine the 15th term of the sequence
3, 9, 27, ...

$$9 / 3 = 3$$

$$27 / 9 = 3$$

Geometric

$$r = 3$$

$$g_{15} = 3 \cdot 3^{15-1}$$

$$g_{15} = 3 \cdot 3^{14}$$

$$g_{15} = 3(4782969)$$

$$g_{15} = 14348907$$

17. Determine the 35th term of the sequence
120, 104, 88, ...

$$104 - 120 = -16$$

$$88 - 104 = -16$$

Arithmetic

$$d = -16$$

$$a_{35} = 120 - 16(35-1)$$

$$a_{35} = 120 - 16(34)$$

$$a_{35} = 120 - 544$$

$$a_{35} = -424$$

12. Determine the 25th term of the sequence
-25, -50, -75, ...

$$-50 - (-25)$$

$$-50 + 25 = -25$$

$$-75 - (-50)$$

$$-75 + 50 = -25$$

Arithmetic

$$d = -25$$

$$a_{25} = -25 + (-25)(24)$$

$$a_{25} = -25 - 600$$

$$a_{25} = -625$$

14. Determine the 30th term of the sequence
16, 24, 32, ...

$$24 - 16 = 8$$

$$32 - 24 = 8$$

Arithmetic

$$d = 8$$

$$a_{30} = 16 + 8(30-1)$$

$$a_{30} = 16 + 8(29)$$

$$a_{30} = 16 + 232$$

$$a_{30} = 248$$

16. Determine the 8th term of the sequence

300, 30, 3, ...

$$30 / 300 = 1/10$$

$$3 / 30 = 1/10$$

Geometric

$$r = 1/10$$

$$g_8 = 300 \cdot \left(\frac{1}{10}\right)^{8-1}$$

$$g_8 = 300 \left(\frac{1}{10}\right)^7$$

$$g_8 = \frac{300}{10000000}$$

$$g_8 = 0.00003$$

18. Determine the 11th term of the sequence
-8000, 4000, -2000, 1000, ...

$$4000 / -8000 = -1/2$$

$$-2000 / 4000 = -1/2$$

Geometric

$$r = -1/2$$

$$g_{11} = -8000 \left(-\frac{1}{2}\right)^{11-1}$$

$$g_{11} = -8000 \left(-\frac{1}{2}\right)^{10}$$

$$g_{11} = \frac{-8000}{1024}$$

$$g_{11} = -7.8125$$