

## Lesson 3 Homework - Geometric Sequences

Date \_\_\_\_\_ Period \_\_\_\_\_

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**Circle the sequences that are geometric. If the sequence is geometric state its common ratio.**

1) 1, 2, 4, 8, 16, ...

2) 4, 9, 16, 25, 36, ...

3) -3, 2, 7, 12, 17, ...

4) 6, 0.6, 0.06, 0.006, ...

**State the common ratio, then write the next 3 terms of the sequence.**

5) -1, -3, -9, ...

6) 4, -2, 1, ...

7) 48, 24, 12, ...

8)  $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \dots$

**For each geometric sequence, determine the indicated value.**

9) 3, 6, 12, ... ; find  $t_7$

10) 18, 9, 4.5, ... ; find  $t_6$

11) 23, -46, 92, ... ; find  $t_{10}$

12)  $2, \frac{1}{2}, \frac{1}{8}, \dots$  ; find  $t_5$

**Using the given information, identify each geometric series as either increasing or decreasing.**

13)  $r = 4, t_1 = -3$

14)  $r = 2, t_1 = 5$

15)  $r = 0.5, t_1 = 3$

16)  $r = \frac{1}{3}, t_1 = -9$

**Create the first 5 terms of a geometric sequence where:**

17) the 6th term is 64

18) the 1st term is  $\frac{3}{4}$

19) every term is negative

20) every term is an even number

**Use the given data about each finite geometric series to determine the indicated values.**

21)  $t_1 = -1$  ,  $r = -2$

22)  $t_1 = 0.002$  and  $t_4 = 2$

a) Find  $t_9$

a) Find  $t_7$

b) The last term is -4096.  
How many terms are in the sequence?

b) Which term has the value 20 000?

**The first term in a sequence is 8 and the last term is 128 and there are 5 terms in the sequence.**

23) If it is an arithmetic sequence, find the three middle terms.

24) If it is a geometric sequence, find the three middle terms.

**In a geometric sequence,  $t_3 = 9$  and  $t_6 = 1.125$**

25) Find  $t_7$

26) Find  $t_9$

**Solve the following problems.**

27) If an arithmetic sequence and a geometric sequence have the same first term, and the common difference is equal to the common ratio (which is greater than 1), which will increase more rapidly as more terms are added?

28) A farmer wants to estimate the value of a new tractor a few years after its purchase. A new tractor worth \$370 000 depreciates in value by about 10% each year.

Estimate the value of the tractor at the end of each of the first 5 years.

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**Circle the sequences that are geometric. If the sequence is geometric state its common ratio.**

1) 1, 2, 4, 8, 16, ...

$r = 2$

2) 4, 9, 16, 25, 36, ...

Not geometric

3) -3, 2, 7, 12, 17, ...

Not geometric

4) 6, 0.6, 0.06, 0.006, ...

$r = 0.1$

**State the common ratio, then write the next 3 terms of the sequence.**

5) -1, -3, -9, ...

$r = 3 ; \dots, -27, -81, -243, \dots$

6) 4, -2, 1, ...

$r = -0.5 ; \dots, -0.5, 0.25, -0.125, \dots$

7) 48, 24, 12, ...

$r = 0.5 ; \dots, 6, 3, 1.5, \dots$

8)  $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \dots$   $r = \frac{1}{3} ; \dots, \frac{1}{54}, \frac{1}{162}, \frac{1}{486}, \dots$

**For each geometric sequence, determine the indicated value.**

9) 3, 6, 12, ... ; find  $t_7$

192

10) 18, 9, 4.5, ... ; find  $t_6$

0.5625

11) 23, -46, 92, ... ; find  $t_{10}$

-11 776

12)  $2, \frac{1}{2}, \frac{1}{8}, \dots$  ; find  $t_5$   $\frac{1}{128}$

**Using the given information, identify each geometric series as either increasing or decreasing.**

13)  $r = 4, t_1 = -3$

decreasing

14)  $r = 2, t_1 = 5$

increasing

15)  $r = 0.5, t_1 = 3$

decreasing

16)  $r = \frac{1}{3}, t_1 = -9$

increasing

**Create the first 5 terms of a geometric sequence where:**

17) the 6th term is 64

answers will vary EX: 2, 4, 8, 16, 32, 64, ...

18) the 1st term is  $\frac{3}{4}$  answers will vary EX:  $\frac{3}{4}, \frac{3}{8}, \frac{3}{16}, \frac{3}{32}, \frac{3}{64}, \dots$

19) every term is negative

answers will vary EX: -1, -3, -9, -27, -81, ...

20) every term is an even number

answers will vary EX: 2, 8, 16, 32, 64, ...

**Use the given data about each finite geometric series to determine the indicated values.**

21)  $t_1 = -1$  ,  $r = -2$

a) Find  $t_9$

b) The last term is -4096.

How many terms are in the sequence?

$t_9 = -256$  , There are 13 terms in the sequence.

22)  $t_1 = 0.002$  and  $t_4 = 2$

a) Find  $t_7$

b) Which term has the value 20 000?

$t_7 = 2000$  and  $t_8 = 20000$

**The first term in a sequence is 8 and the last term is 128 and there are 5 terms in the sequence.**

23) If it is an arithmetic sequence, find the three middle terms.

38, 68, 98

24) If it is a geometric sequence, find the three middle terms.

16, 32, 64

**In a geometric sequence,  $t_3 = 9$  and  $t_6 = 1.125$**

25) Find  $t_7$

0.5625

26) Find  $t_9$

0.140625

**Solve the following problems.**

27) If an arithmetic sequence and a geometric sequence have the same first term, and the common difference is equal to the common ratio (which is greater than 1), which will increase more rapidly as more terms are added?

geometric sequence

28) A farmer wants to estimate the value of a new tractor a few years after its purchase. A new tractor worth \$370 000 depreciates in value by about 10% each year.

Estimate the value of the tractor at the end of each of the first 5 years.

Y1 = \$333 000 Y2 = \$299 700 Y3 = \$269 730 Y4 = \$242