

Geometric Sequences Worksheet

A **geometric sequence** is a sequence of numbers in which each term is found by **multiplying the previous term by the same number**. This number is called the **common ratio (r)**.

Formula for the nth Term

$$a_n = a_1(r)^{n-1}$$

Where:

- a_n = nth term
- a_1 = first term
- r = common ratio
- n = term number

Example 1 – Find the Next Three Terms

Find the next three terms in the sequence: **3, 6, 12, 24, ...**

Step 1. Find the common ratio. $\frac{6}{3} = 2$

The common ratio is 2.

Step 2. Multiply each term by 2.

$$24 \times 2 = 48$$

$$48 \times 2 = 96$$

$$96 \times 2 = 192$$

Answer

48, 96, 192

Example 2 – Find the Common Ratio

Find the common ratio of the sequence: **81, 27, 9, 3, ...**

Step 1. Divide consecutive terms. $\frac{27}{81} = \frac{1}{3}$

The common ratio is: $r = \frac{1}{3}$

Example 3 – Find the 8th Term

Find the 8th term of the sequence: **5, 10, 20, 40, ...**

Step 1. Identify the values.

- $a_1 = 5$
- $r = 2$
- $n = 8$

Step 2. Use the formula. $a_n = a_1(r)^{n-1}$

Substitute the values. $a_8 = 5(2)^7$

Step 3. Evaluate the exponent. $2^7 = 128$

Step 4. Multiply. $5(128) = 640$

Answer: The 8th term is 640.

Part A – Find the Next Three Terms

1. 2, 4, 8, 16, _____, _____, _____

2. 5, 15, 45, 135, _____, _____, _____

3. 64, 32, 16, 8, _____, _____, _____

4. 1, 3, 9, 27, _____, _____, _____

5. 160, 80, 40, 20, _____, _____, _____

Part B – Find the Common Ratio - Find the common ratio.

6. 4, 12, 36, 108 $r =$ _____

7. 100, 50, 25, 12.5 $r =$ _____

8. 7, 14, 28, 56 $r =$ _____

9. 243, 81, 27, 9 $r =$ _____

10. 6, 18, 54, 162 $r =$ _____

Part C – Find the Missing Term

11. 3, 9, _____, 81, 243

12. 128, 64, _____, 16, 8

13. 2, 10, _____, 250

14. 1, 4, _____, 64

15. 200, 100, _____, 25

Part D – Find the n th Term

Use the formula: $a_n = a_1(r)^{n-1}$

16. Find the **6th term**.

Sequence: 2, 6, 18, 54, ...

Answer: _____ $(3)^5 =$ _____

17. Find the **7th term**.

Sequence: 3, 9, 27, 81, ...

Answer: _____ $(3)^6 =$ _____

18. Find the **5th term**.

Sequence: 100, 50, 25, 12.5, ...

Answer: _____ $\left(\frac{1}{2}\right)^4 =$ _____

19. Find the **8th term**.

Sequence: 1, 2, 4, 8, ...

Answer: _____ $(2)^7 =$ _____

20. Find the **6th term**.

Sequence: 64, 32, 16, 8, ...

Answer: _____ $\left(\frac{1}{2}\right)^5 =$ _____

Part E – Identify the Sequence: Write Arithmetic, Geometric, or Neither.

21. 5, 10, 20, 40, 80 _____

22. 8, 13, 18, 23, 28 _____

23. 2, 6, 12, 20, 30 _____

24. 81, 27, 9, 3, 1 _____

25. 100, 90, 81, 73 _____