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 × 2 = 48
48 × 2 = 96
96 × 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.

LIVEWORKSHEETS

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 nth 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 _____

LIVEWORKSHEETS