Geometric sequences

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Find r, u_6 for $4, 12, 36, \ldots$. [2 marks]

$4(3^5) = 972$.

Answer: $r = 3, u_6 = 972$.

2. Find u_8 if $a = 128, r = -1/2$. [2 marks]

$128(-1/2)^7 = -1$.

Answer: -1.

3. A positive geometric sequence has $u_2 = 10, u_5 = 80$. Find a, r. [2 marks]

$r^3 = 80/10 = 8$ and $a = 10/2 = 5$.

Answer: $a = 5, r = 2$.

4. Is $2, 6, 18, 55$ geometric? [2 marks]

The first two ratios are 3, but $55/18 \neq 3$.

Answer: No.

5. Find both real geometric sequences with $u_1 = 8, u_3 = 2$. Give the first four terms. [2 marks]

$r^2 = 1/4$, so $r = \pm 1/2$.

Answer: $8, 4, 2, 1$ and $8, -4, 2, -1$.

6. A culture has 300 cells at hour zero and doubles hourly. Give its rule and first whole hour above 10,000. [3 marks]

$N_5 = 9600$ and $N_6 = 19200$.

Answer: $N_n = 300(2^n)$; hour 6.