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 $a = 128, r = -\frac{1}{2}$. [2 marks]

$128\left(-\frac{1}{2}\right)^7 = -1.$

Answer: $-1.$

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

$r^3 = \frac{80}{10} = 8$ and $a = \frac{10}{2} = 5.$

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

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

The first two ratios are 3, but $\frac{55}{18} \neq 3.$

Answer: No.

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

$r^2 = \frac{1}{4}$, so $r = \pm\frac{1}{2}$.

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.