



Skill: Arithmetic and Geometric Series Mixed (inc. Sigma Notation)

Questions

Attempt these questions independently showing full and clear solutions. Check each answer as you go.

1. The second, third and ninth terms of an arithmetic progression form a geometric progression. Find the common ratio of the geometric progression.
2. In an arithmetic progression the 1st, 2nd and 5th terms are in geometric progression. Find the common ratio of the geometric progression.
3. The 1st, 2nd and 3rd terms of a GP are the 1st, 7th and 9th terms of an AP. Find the common ratio of the GP.
4. Given that a, 10 and b are consecutive terms of an AP, and 1, a and b are consecutive terms of a GP, find the possible values of a and b.
5. The numbers 2, p and q are consecutive terms of a GP, and the numbers p, 30 and q are consecutive terms of an AP. Find the possible values of p and q.
6. State whether the following sums form an arithmetic or geometric progression and evaluate them. Answers relying entirely on the summation function on your calculator are not acceptable.
 - a) $\sum_{n=1}^{20} (5 + 3n)$
 - b) $\sum_{n=1}^8 (4^n)$
 - c) $\sum_{n=1}^{100} (6 - 2n)$
 - d) $\sum_{a=5}^{20} (3a + 2)$
 - e) $\sum_{k=7}^{12} (2 \times 3^k)$
 - f) $\sum_{r=1}^{\infty} \left(5 \times \left(\frac{1}{2} \right)^r \right)$
 - g) $\sum_{n=3}^{18} \left(6 \times \left(\frac{1}{4} \right)^{n-2} \right)$
 - h) $\sum_{n=10}^{24} \left(6n + \left(\frac{1}{3} \right)^n \right)$
 - i) $\sum_{n=1}^{50} \left(\left(\frac{1}{3} \right)^n + 2n + 3 \right)$