GEOMETRIC SEQUENCES

Task 1 – Find the next term in each of the following sequences.

1) 3, 6, 12, 24, ...
2) 5, 10, 20, 40, ...
3) 2, 20, 200, 2000, ...
4) 81, 27, 9, 3, ...
5) 5, 40, 320, 2560, ...
6) ½, 1, 2, 4, ...
7) 100, 50, 25, 12.5, ...
8) -2, 6, -18, 54, ...
9) 7, 21, 63, 189, ...
10) 0.2, 0.8, 3.2, 12.8, ...
11) 5, -25, 125, -625, ...
12) 3a, 6a, 12a, 24a, ...
13) b + 2, 3b + 6, 9b + 18, ...

Task 2 – For each of the following sequences, state the first term and the common ratio.

14) 2, 10, 50, 250, ...
15) 64, 32, 16, 8, ...
16) 3, -6, 12, -24, ...
17) $\frac{1}{3}$, 1, 3, 9, ...
18) 200, 100, 50, 25, ...
19) 5, 15, 45, 135, ...

Task 3 – The nth term formula of geometric sequences are given. Work out the first three terms of each sequence.

20) $a_n = 2^{n-1}$
21) $a_n = 5^{n-1}$
22) $a_n = 2 \times 3^{n-1}$
23) $a_n = 3 \times 4^{n-1}$
24) $a_n = -6 \times 2^{n-1}$

Task 4 – For each of the following sequences, work out the nth term formula.

25) 4, 12, 36, 108, ...
26) 2, 8, 32, 128, ...
27) 7, 14, 28, 56, ...
28) 81, 27, 9, 3, ...
29) ½, 1, 2, 4, ...
30) -3, 6, -12, 24, ...

Task 5

31) Consider the sequence: 5, 15, 45, 135, ... Is 3,645 a term in the sequence? Give a reason for your answer.

32) Consider the sequence: 2, 6, 18, 54, ... Is 486 a term in the sequence? Give a reason for your answer.

33) Consider the sequence: -4, 8, -16, 32, ... Is -512 a term in the sequence? Give a reason for your answer.

Challenge

34) The nth term formula for two geometric sequences are as follows:
Sequence A: $3 \times 2^{n-1}$
Sequence B: $192 \times \left(\frac{1}{2}\right)^{n-1}$
For what value of n are the nth terms equal? You must show clear algebraic working. Do not use trial and error.

35) The 4th term of a geometric sequence is 54. The 7th term is 1458.
Work out:
a. The common ratio
b. The first term
c. The formula for the nth term

36) The first term of Sequence A is 5 and the common ratio is 3. The first term of Sequence B is 405 and the common ratio is $\frac{1}{3}$. For which term number do the sequences have the same value? You must show clear algebraic working. Do not use trial and error.