

3.4) Geometric series

Worked example

Find the sum of the first 10 terms:

2, 6, 18, 54, 162, ...

4, 20, 100, 500, 2500, ...

Your turn

Find the sum of the first 10 terms:

3, 6, 12, 24, 48, ...

3069

Worked example

Find the sum of the first 10 terms:

$$2, \frac{1}{2}, \frac{1}{8}, \frac{1}{32}, \frac{1}{128}, \dots$$

$$243, -81, 27, -9, 3, \dots$$

Your turn

Find the sum of the first 10 terms:

$$4, 2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$$

$$\frac{1023}{128}$$

Worked example

Find the least value of n such that the sum of $1 + 3 + 9 + 27 + \dots$ to n terms would exceed 2 000 000.

Your turn

Find the least value of n such that the sum of $1 + 2 + 4 + 8 + \dots$ to n terms would exceed 2 000 000.

$$n = 21$$

Worked example

A geometric series has first term a and common ratio r .

The sum of the first two terms of the series is 9.

The sum of the first four terms of the series is 45.

Find the two possible geometric sequences.

Your turn

A geometric series has first term a and common ratio r .

The sum of the first two terms of the series is 8

The sum of the first four terms of the series is 80

Find the two possible geometric sequences

$$u_n = 2 \times 3^{n-1}$$

$$u_n = -4 \times (-3)^{n-1}$$