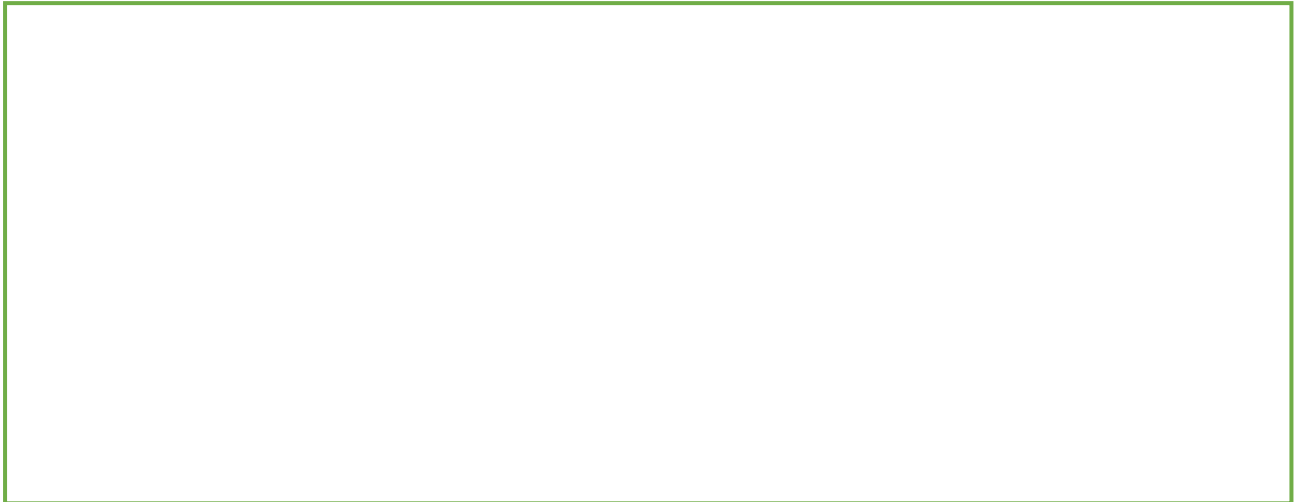


Geometric Series

Identify the common ratio r :

- 1 1, 2, 4, 8, 16, 32, ...
- 2 27, 18, 12, 8, ...
- 3 10, 5, 2.5, 1.25, ...
- 4 5, -5, 5, -5, 5, -5, ...
- 5 $x, -2x^2, 4x^3$
- 6 $1, p, p^2, p^3, \dots$
- 7 4, -1, 0.25, -0.0625, ...

Examples

1. Determine the 10th and n^{th} terms of the following:

a) 3, 6, 12, 24, ...

b) 40, -20, 10, -5, ...

2. The second term of a geometric sequence is 4 and the 4th term is 8. The common ratio is positive. Find the exact values of:

a) The common ratio.

b) The first term.

c) The 10th term.

3. The numbers 3, x and $x + 6$ form the first three terms of a positive geometric sequence. Find:

a) The value of x .

b) The 10th term in the sequence.

Inequalities Example

What is the first term in the geometric progression 3, 6, 12, 24, ... to exceed 1 million?

Test Your Understanding

1. All the terms in a geometric sequence are positive.

The third term of the sequence is 20 and the fifth term 80. What is the 20th term?

2. The second, third and fourth term of a geometric sequence are the following:

$$x, \quad x + 6, \quad 5x - 6$$

- a) Determine the possible values of x .
- b) Given the common ratio is positive, find the common ratio.
- c) Hence determine the possible values for the first term of the sequence.