

JAMB FREE MATHEMATICS TUTORIAL

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Before we proceed, please TAKE NOTE of the following:

- We strongly recommend you take your time and read this topic. You can read it again and again.
- Make sure you attempt all the exercises on this page.
- This page is also suitable for candidates writing other exams like WAEC/NECO/NABTEB etc.
- Please SHARE THIS PDF WITH YOUR FRIENDS.
- Have you heard of **Allschool VIP JAMB Online Lesson**? The Lesson is strictly based on JAMB Syllabus, which means our teachers focus on the exact things that will most likely come out in JAMB. **Joining the Lesson is one of the surest ways to score high in JAMB.** [Click here](#) to see how to join and other details or visit allschool.com.ng/jamb

GEOMETRIC PROGRESSION (G.P)

A geometric progression or exponential sequence is a form of sequence that has a common ratio between any of the terms and its preceding one

Example 1

- 2, 4, 8, ...

We observe that the common ratio here is $4/2 = 8/4$ giving rise to the common ratio $(r) = 2$

In summary, the general term of a GP is in the form of $a, ar_2, ar_3, \dots, ar_n$ thereby giving rise to the general term of a GP to be $T_n = ar_{n-1}$

Example 2

- Determine the third term of a geometric progression whose first and fourth term are 4 and 108 respectively

Solution1

To determine the 3rd term, we need to know the r apart from the given "a" first term

$$T_4 \rightarrow 108 = 4r_{4-1}$$

$$108 = 4r^3$$

$$108/4 = r^3$$

Raise both sides to the same power

$$3^3 = r^3$$

$$3 = r$$

$$\text{Thus, } T_3 = 4(3)^{3-1}$$

$$= 36$$

SUM OF A GP TO INFINITY (S_∞)

A GP whose common ratio is between -1 and +1 say $-1/2$, $1/2$, $-1/4$, $1/4$ etc has sum which approaches a finite value as n approaches infinity. It is given as

$$S_{\infty} = a/1 - r$$

Example 2

The first and sixth term of a GP are 8 and $1/4$ respectively. What is its sum to infinity?

Solution 2

$$S_{\infty} = a/1 - r$$

r can be gotten from T6 $\rightarrow 1/4 = 8(r)^5$

multiply through by $1/8$

$$1/32 = r^5$$

Raise both sides to the same powers

$$(1/32)^5 = r^5$$

Equating terms

$$1/2 = r$$

Thus

$$S_{\infty} = 8/1-0.5$$

$$= 8/0.5$$

$$= 16$$

EXERCISES ON GP

The exercises are:

1. Evaluate $(\frac{1}{2}, -\frac{1}{4} + \frac{1}{8} - \frac{1}{16} + \dots) - 1$
a) $\frac{2}{3}$ b) 0 c) $-\frac{2}{3}$ d) -1
2. The first term of a GP is 350. If the sum to infinity is 250, find the common ratio
a) $-\frac{5}{7}$ c) $-\frac{2}{5}$ c) $\frac{2}{5}$ d) $\frac{5}{7}$
3. The first term of a GP is twice its common ratio. Find the sum of the first two terms of the progression. If its sum to infinity is 8
a) $\frac{8}{5}$ b) $\frac{8}{3}$ c) $\frac{72}{25}$ d) $\frac{46}{9}$

The answers to the GP exercises are

1. C($-\frac{2}{3}$)
2. C($-\frac{2}{5}$)
3. C($\frac{72}{25}$)

ONCE AGAIN REMEMBER: We now have an
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