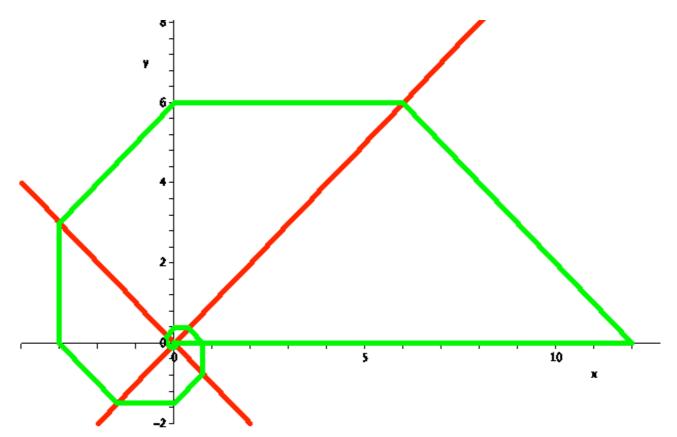
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## Geometric Series in Geometry

## I. Length of an infinite Geometric Spiral :



Let  $\ell_o$  be the length or the first horizontal segment :  $\ell_o = 12$ .

- 1. Find the length of the second segment  $\ell_1 = \dots$
- 2. Find the relationship between  $\ell_{a}$  and  $\ell_{a+1}$  according to the above construction.

3. Let 
$$S_n = \ell_0 + \ell_1 + \ell_2 + \dots + \ell_n = \sum_{i=0}^{i=n} \ell_i$$

a. Give the expression of  $S_n$  in terms of  $\boldsymbol{\ell_o}~$  and n.

b. Give the expression of 
$$S = \lim_{n \to \infty} S_n = \sum_{0}^{\infty} \ell_n$$

c. What is the value of S?

http://beijingshanmaths.org Name : [ jiguanglaoshi@gmail.com

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II.