

Answer on Question #79282 – Math - Algebra

Question

Find the geometric series of a geometric sequence if the n th term is 20, the number of terms is 10 and the common ratio is 2.

Solution

Formula for n^{th} element of geometrical progression is $b_n = b_1 q^{n-1}$.

We have: $b_n = 20$, $n = 10$, $q = 2$.

Let's find b_1 :

$$20 = b_1 \cdot 2^{10-1};$$

$$b_1 = \frac{20}{2^{10-1}} = \frac{20}{2^9} = \frac{20}{512} = \frac{5}{128}. \text{ So, if we have } b_1 \text{ and other parameters we can find other}$$

elements of geometrical progression:

$$b_2 = \frac{5}{128} \cdot 2^{2-1} = \frac{5}{64};$$

$$b_3 = \frac{5}{128} \cdot 2^{3-1} = \frac{5}{32};$$

$$b_4 = \frac{5}{128} \cdot 2^{4-1} = \frac{5}{16};$$

$$b_5 = \frac{5}{128} \cdot 2^{5-1} = \frac{5}{8};$$

$$b_6 = \frac{5}{128} \cdot 2^{6-1} = \frac{5}{4};$$

$$b_7 = \frac{5}{128} \cdot 2^{7-1} = \frac{5}{2};$$

$$b_8 = \frac{5}{128} \cdot 2^{8-1} = 5;$$

$$b_9 = \frac{5}{128} \cdot 2^{9-1} = 10;$$

$$b_{10} = \frac{5}{128} \cdot 2^{10-1} = 20.$$

Answer:

Geometric series is $\frac{5}{128}; \frac{5}{64}; \frac{5}{32}; \frac{5}{16}; \frac{5}{8}; \frac{5}{4}; \frac{5}{2}; 5; 10; 20; \dots$