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Geometric Series / Sequence : Example (2)

If $2x+5$, $6x-10$ and $8x+20$ are consecutive terms in a geometric series. Find the possible values of x and the corresponding terms.

$$\frac{6x-10}{2x+5} = \frac{8x+20}{6x-10}$$

$$\begin{array}{c} \xrightarrow{\times 3} \quad \xrightarrow{\times 3} \\ \dots 5, 15, 45, \dots \\ \frac{15}{5} = \frac{45}{15} = 3 \end{array}$$

$$\therefore (6x-10)(6x-10) = (2x+5)(8x+20)$$

$$\therefore 36x^2 - 120x + 100 = 16x^2 + 80x + 100$$

$$\therefore 20x^2 - 200x = 0$$

$$\therefore 20x(x-10) = 0$$

$$\therefore x = 0 \text{ or } x - 10 = 0$$

$$\therefore x = 0 \text{ or } x = 10$$

When $x=0$, terms are $5, -10, 20$

When $x=10$, terms are $25, 50, 100$



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