

### Answer on Question #49122 – Math – Calculus

**Question:** determine whether the series is convergent or divergent and find its sum if exists

$$6 + 0.6 + 0.06 + \dots$$

**Solution:** let us transform our series:

$$6 + 0.6 + 0.06 + \dots = 6 \cdot (1 + 0.1 + 0.01 + \dots) = 6 \cdot \sum_{n=0}^{\infty} (0.1)^n$$

It took the form of infinite geometrical series with common ratio  $r = 0.1 < 1$ , therefore it converges. The sum of infinite geometrical series is calculated by

$$\sum_{n=0}^{\infty} r^n = \frac{1}{1-r}$$

Thus, we obtain

$$6 \cdot \sum_{n=0}^{\infty} (0.1)^n = 6 \cdot \frac{1}{1-0.1} = \frac{6}{0.9} = \frac{20}{3}$$

**Answer:** the series is convergent and its sum is

$$6 + 0.6 + 0.06 + \dots = \frac{20}{3}$$