Question #53928

Determine whether the sequence converges or diverges. If it converges, give the limit.

11, 22, 44, 88, …

Solution.

$$a_1 = 11 = 1 \cdot 11 = 2^0 \cdot 11$$

$$a_2 = 22 = 2 \cdot 11 = 2^1 \cdot 11$$

$$a_3 = 44 = 4 \cdot 11 = 2^2 \cdot 11$$

$$a_4 = 88 = 8 \cdot 11 = 2^3 \cdot 11$$

As you can see:

$$a_n = 2^{n-1} \cdot 11$$

$$\lim_{n \to \infty} 2^{n-1} \cdot 11 = +\infty$$

So, $a_n \nrightarrow 0$, $n \to \infty$ and sequence diverges.

Answer: diverges.