15. Show that the sequence whose nth term is $T_n = 2 \times 3^n$ is a geometric sequence.

To show that a sequence is geometric, we must show that $\frac{T_{n+1}}{T_n}$ = a constant (r).

$T_n = 2(3^n)$

$T_{n+1} = 2(3^{n+1})$

$3^{n+1} = (3)(3^n)$

$$\frac{T_{n+1}}{T_n} = \frac{\cancel{2}(\cancel{3^n})(3)}{\cancel{2}(\cancel{3^n})} = 3 = r$$

16. Investigate if the sequence $T_n = 3 \times n^2$ is geometric.

If geometric

$\Rightarrow \frac{T_{n+1}}{T_n} = r$

a constant

$$\frac{T_{n+1}}{T_n} = \frac{3(n+1)^2}{3n^2}$$

$$= \frac{\cancel{3}[n^2 + 2n + 1]}{\cancel{3}n^2}$$

$$= \frac{n^2 + 2n + 1}{n^2} \neq \text{constant}$$

$\Rightarrow$ not geometric