The nth term of a geometric sequence is U_n , where Un $=48(\frac{1}{4})^n$

a) Find U_1

b) Find the sum to infinity of the series

a) $U_n = 48\left(\frac{1}{4}\right)^n$

For U_n , n=1

$U_1 = 48\left(\frac{1}{4}\right)^1$

$U_1 = 48 \times \frac{1}{4}$

$U_1 = 48 \div 4$

$U_1 = 12$

b) $U_1 = 12$

$r = \frac{1}{4}$

Series is convergent because -1 < r < 1

$S_\infty = \frac{U_1}{1-r}$

$S_\infty = \frac{12}{1-\frac{1}{4}}$

$S_\infty = \frac{12}{\frac{3}{4}}$

$S_\infty = 12 \div \frac{3}{4}$

$S_\infty = 12 \times \frac{4}{3}$

$S_\infty = 12 \times \frac{1}{3} \times 4$

$S_\infty = 4 \times 4$

$S_\infty = 16$