2.72
-2

(1) $7, 77, 777, \dots$

$* \quad 70, 700, \dots$

$a_n = a_1 + S^*_{n-1}$

$a_n = 7 + \frac{70 \cdot (10^{n-1} - 1)}{10 - 1} = 7 + \frac{7(10^n - 10)}{9} = \frac{7 \cdot 10^n - 7}{9} = \frac{7}{9}(10^n - 1)$

(2) $S_n = \frac{7}{9}(10^1 - 1) + \frac{7}{9}(10^2 - 1) + \dots + \frac{7}{9}(10^n - 1) =$

$= \frac{7}{9}(10^1 + 10^2 + \dots + 10^n) - \frac{7}{9}n = \frac{7}{9} \cdot \frac{10(10^n - 1)}{10 - 1} - \frac{7}{9}n = \frac{7}{9}\left(\frac{10^{n+1} - 10}{9} - n\right) =$

$= \frac{7}{81}(10^{n+1} - 10 - 9n)$