

2.81
2

(1) $n=1$ $a_1 = \frac{8}{9}(10-1) = 8 \checkmark$

$n=k$ $a_k = \frac{8}{9}(10^k-1)$

$n=k+1$ $a_{k+1} = \frac{8}{9}(10^{k+1}-1)$

$a_{k+1} \stackrel{?}{=} 10a_k + 8 = 10 \cdot \frac{8}{9}[10^k-1] + 8 = \frac{8}{9}[10^{k+1}-1] = 8 \cdot 8$

$\hookrightarrow = \frac{8}{9}(10^{k+1}-1)$

8, 88, 888, ...

ישנה מסו ~~אשר~~ a_n

(*) 80, 800, ...

$a_n = a_1 + S_{n-1}$

$a_n = 8 + \frac{80(10^{n-1}-1)}{10-1} = \frac{72 + 8(10^{n-1}-10)}{9} = \frac{8}{9}(10^{n-1}-1)$

(2) $\frac{8}{9}(10-1) + \frac{8}{9}(10^2-1) + \dots + \frac{8}{9}(10^n-1) = S_n$

$\frac{8}{9}(10+10^2+\dots+10^n) - \frac{8}{9} \cdot n = \frac{8}{9} \cdot \frac{10(10^n-1)}{10-1} - \frac{8}{9}n =$

$\frac{80(10^n-1) - 8n}{89} = \frac{8(10^{n+1}-10-9n)}{89}$