

הגורם המרכזי הוא 517

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x} = 0$$

$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1 \quad \lim_{x \rightarrow 0} \frac{\ln(1+x)}{x} = 1$$

אם כן, נראה כי  $\lim_{x \rightarrow 0} \frac{\ln(4x+1)^9 \ln(7x+1)^{14} \ln(10x+1)^{17}}{(e^{8x}-1)^9 \sin(8x)^{21}} = 1$

$$\lim_{x \rightarrow 0} \frac{\ln(4x+1)^9 \ln(7x+1)^{14} \ln(10x+1)^{17}}{(e^{8x}-1)^9 \sin(8x)^{21}}$$

$$= \lim_{x \rightarrow 0} \frac{\ln(4x+1)^9 (4x)^9 \ln(7x+1)^{14} (7x)^{14} \ln(10x+1)^{17} (10x)^{17}}{(e^{8x}-1)^9 (8x)^9 \sin(8x)^{21} (8x)^{21}}$$

$$= \lim_{x \rightarrow 0} \frac{\ln(4x+1)^9}{(4x)^9} \lim_{x \rightarrow 0} \frac{\ln(7x+1)^{14}}{(7x)^{14}} \lim_{x \rightarrow 0} \frac{\ln(10x+1)^{17}}{(10x)^{17}} \lim_{x \rightarrow 0} \frac{(8x)^9}{(e^{8x}-1)^9}$$

$$\lim_{x \rightarrow 0} \frac{(8x)^{21}}{\sin(8x)^{21}} \lim_{x \rightarrow 0} \frac{(4x)^9 (7x)^{14} (10x)^{17}}{(8x)^9 (8x)^{21}}$$

$$= \lim_{x \rightarrow 0} \frac{4^9 \cdot 7^{14} \cdot 10^{17} x^{40}}{8^{40} x^{40}} = \frac{4^9 \cdot 7^{14} \cdot 10^{17}}{8^{40}}$$