35.5

α) Είναι $f'(x)=\dfrac{e^x}{\sqrt{x}}$ και $g'(x)=f(3x)$

Οπότε

$$g''(x)=f'(3x)\cdot(3x)' \overset{f'(3x)=\frac{e^{3x}}{\sqrt{3x}}}{\Rightarrow} \boxed{g''(x)=\frac{3e^{3x}}{\sqrt{3x}}} \Rightarrow g''(1)=\frac{3e^{3\cdot1}}{\sqrt{3\cdot1}} \Rightarrow$$

$$\Rightarrow g''(1)=\frac{3e^3}{\sqrt{3}} \Rightarrow g''(1)=\frac{\cancel{3}\sqrt{3}e^3}{\cancel{3}} \Rightarrow \boxed{g''(1)=e^3\sqrt{3}}$$

β) $$\lim_{x\to0^+}\frac{\sqrt{x}g''(x)-\sqrt{3}}{\sqrt{x+1}-1} \overset{g''(x)=\frac{3e^{3x}}{\sqrt{3x}}}{=} \lim_{x\to0^+}\frac{\sqrt{x}\dfrac{3e^{3x}}{\sqrt{3}\sqrt{x}}-\sqrt{3}}{\sqrt{x+1}-1} = \lim_{x\to0^+}\frac{\sqrt{3}e^{3x}-\sqrt{3}}{\sqrt{x+1}-1} \underset{DLH}{\overset{\frac{0}{0}}{=}}$$

$$\lim_{x\to0^+}\frac{3\sqrt{3}e^{3x}}{\dfrac{1}{2\sqrt{x+1}}}=6\sqrt{3}e^3$$