$$f(x)=e^{-\frac{1}{x}}\sqrt{x^2+x}$$

$$f'(x)=e^{-\frac{1}{x}}\cdot\left(-\left(-\frac{1}{x^2}\right)\right)\sqrt{x^2+x}+e^{-\frac{1}{x}}\frac{1}{2\sqrt{x^2+x}}\cdot(2x+1)=$$

$$=e^{-\frac{1}{x}}\left(\frac{\sqrt{x^2+x}}{x^2}+\frac{2x+1}{2\sqrt{x^2+x}}\right)=e^{-\frac{1}{x}}\cdot\frac{\sqrt{x^2+x}\cdot 2\sqrt{x^2+x}+(2x+1)\cdot x^2}{2x^2\sqrt{x^2+x}}=$$

$$=e^{-\frac{1}{x}}\cdot\frac{2x^2+2x+2x^3+x^2}{2x^2\sqrt{x^2+x}}=e^{-\frac{1}{x}}\frac{2x^2+3x+2}{2x\sqrt{x^2+x}}$$

$$|\cdot\sqrt{x^2+x}$$

$$f''(x)=e^{-\frac{1}{x}}\cdot\frac{1}{x^2}\cdot\frac{2x^2+3x+2}{2x\sqrt{x^2+x}}+e^{-\frac{1}{x}}\cdot\frac{(4x+3)\cdot 2x\sqrt{x^2+x}-(2x^2+3x+2)\cdot 2\left(\sqrt{x^2+x}+x\cdot\frac{2x+1}{2\sqrt{x^2+x}}\right)}{4x^2(x^2+x)}=$$

$$=e^{-\frac{1}{x}}\left(\frac{2x^2+3x+2}{2x^3\sqrt{x^2+x}}+\frac{2(4x+3)x(x^2+x)-2(2x^2+3x+2)\left(x^2+x+\frac{x}{2}(2x+1)\right)}{4x^2(x^2+x)\sqrt{x^2+x}}\right)=$$

$$=e^{-\frac{1}{x}}\left(\frac{2x^2+3x+2}{2x^3\sqrt{x^2+x}}+\frac{2x(4x^3+3x^2+4x^2+3x)-(2x^2+3x+2)(4x^2+3x)}{4x^2(x^2+x)\sqrt{x^2+x}}\right)=$$

$$=e^{-\frac{1}{x}}\left(\frac{2x^2+3x+2}{2x^3\sqrt{x^2+x}}+\frac{\cancel{8x^4}+\cancel{6x^3}+8x^3+6x^2-\cancel{8x^4}-\cancel{6x^3}-12x^3-9x^2-8x^2-6x}{4x^2(x^2+x)\sqrt{x^2+x}}\right)=$$

$$|:2(x+1)$$

$$=e^{-\frac{1}{x}}\left(\frac{2x^2+3x+2}{2x^3\sqrt{x^2+x}}+\frac{-4x^3-11x^2-6x}{4x^3(x+1)\sqrt{x^2+x}}\right)=$$

$$= e^{-\frac{1}{x}} \left(\frac{2(x+1)(2x^2+3x+2)}{4x^3(x+1)\sqrt{x^2+x}} - \frac{4x^3+11x^2+6x}{4x^3(x+1)\sqrt{x^2+x}} \right) =$$

$$= e^{-\frac{1}{x}} \left(\frac{\cancel{4x^3}+4x^2+6x^2+\cancel{6x}+4x+4}{4x^3(x+1)\sqrt{x^2+x}} - \frac{\cancel{4x^3}+11x^2+\cancel{6x}}{4x^3(x+1)\sqrt{x^2+x}} \right) =$$

$$= e^{-\frac{1}{x}} \frac{-x^2+4x+4}{4x^3(x+1)\sqrt{x^2+x}}$$