Урок 5, задание 4

$$y = \sqrt{x+\sqrt{x+\sqrt{x}}}$$

$$\frac{d}{dx}\left(\sqrt{x+\sqrt{x+\sqrt{x}}}\right) = \frac{d\sqrt{a}}{da}\cdot\frac{da}{dx},\quad a = x+\sqrt{x+\sqrt{x}}$$

$$\frac{d}{da}\left(\sqrt{a}\right) = \frac{1}{2\sqrt{a}}$$

$$\rightarrow \frac{\frac{d}{dx}\left(x+\sqrt{\sqrt{x}+x}\right)}{2\sqrt{x+\sqrt{\sqrt{x}+x}}}$$

$$\downarrow$$

$$\frac{d}{dx}(x)+\frac{d}{dx}\left(\sqrt{\sqrt{x}+x}\right) \rightarrow \frac{1}{2\sqrt{x+\sqrt{\sqrt{x}+x}}}$$

$$\rightarrow \frac{\frac{d}{dx}\left(\sqrt{\sqrt{x}+x}\right)+1}{2\sqrt{x+\sqrt{\sqrt{x}+x}}} \Rightarrow \frac{d\sqrt{a}}{da}\cdot\frac{da}{dx},\ a=\sqrt{x}+x,\ d/da(\sqrt{a})=$$

$$\rightarrow \frac{1+\left(\frac{\frac{d}{dx}\left(\sqrt{x}+x\right)}{2\sqrt{\sqrt{x}+x}}\right)}{2\sqrt{x+\sqrt{\sqrt{x}+x}}} \longrightarrow$$

Продолжение задания 4

$$\rightarrow \frac{1+\left(\frac{d}{dx}\left(\sqrt{x}\right)+\frac{d}{dx}(x)\right)\cdot\frac{1}{2\sqrt{\sqrt{x}+x}}}{2\sqrt{x+\sqrt{\sqrt{x}+x}}} \longrightarrow$$

$$\rightarrow d/dx\left(x^n\right) = nx^{n-1}\quad\left(n=\tfrac{1}{2}\right)$$

$$\frac{d}{dx}\left(\sqrt{x}\right) = \frac{d}{dx}\left(x^{1/2}\right) = \frac{x^{-1/2}}{2}$$

$$\rightarrow \frac{1+\frac{\frac{d}{dx}(x)+\frac{1}{2\sqrt{x}}}{2\sqrt{\sqrt{x}+x}}}{2\sqrt{x+\sqrt{\sqrt{x}+x}}} \rightarrow \frac{1+\frac{\frac{1}{2\sqrt{x}}+1}{2\sqrt{\sqrt{x}+x}}}{2\sqrt{x+\sqrt{\sqrt{x}+x}}}$$

ответ