Задание 5

① $$\lim_{x\to 1}\frac{\sqrt{x^2+2x+6}-\sqrt{x^2+3x+5}}{x-1}=\left(\frac{0}{0}\right)=$$

$$=\lim_{x\to 1}\frac{\left(\sqrt{x^2+2x+6}-\sqrt{x^2+3x+5}\right)\left(\sqrt{x^2+2x+6}+\sqrt{x^2+3x+5}\right)}{(x-1)\left(\sqrt{x^2+2x+6}+\sqrt{x^2+3x+5}\right)}=$$

$$=\lim_{x\to 1}\frac{x^2+2x+6-x^2-3x-5}{(x-1)\left(\sqrt{x^2+2x+6}+\sqrt{x^2+3x+5}\right)}=$$

$$=\lim_{x\to 1}\frac{-(x-1)}{(x-1)\left(\sqrt{x^2+2x+6}+\sqrt{x^2+3x+5}\right)}=$$

$$=\lim_{x\to 1}\frac{-1}{\sqrt{x^2+2x+6}+\sqrt{x^2+3x+5}}=\frac{-1}{\sqrt{9}+\sqrt{9}}=-\frac{1}{6}$$

② $$\lim_{x\to 0}\frac{5\ln(1+5x)\arcsin 4x}{1-\cos 2x}=$$

$$=\lim_{x\to 0}\frac{5\cdot 5x\cdot 4x\cdot 2}{(2x)^2}=50$$