№4

а) $$\lim_{x\to -2}\frac{x^2-7x-8}{2x^2+5x+3}=\left[\frac{(-2)^2-7\cdot(-2)-8}{2\cdot(-2)+5\cdot(-2)+3}=\frac{4+14-8}{-4-10+3}=\right.$$

$$\left.=\frac{10}{-11}\right]=-\frac{10}{11}$$

б) $$\lim_{x\to -1}\frac{x^2-7x-8}{2x^2+5x+3}=\left[\frac{(-1)^2-7\cdot(-1)-8}{2\cdot(-1)^2+5\cdot(-1)+3}=\frac{0}{0}\right]=$$

$$=\lim_{x\to -1}\frac{\cancel{(x+1)}(x-8)}{\cancel{(x+1)}(2x+3)}=\lim_{x\to -1}\frac{x-8}{2x+3}=\left[\frac{-1-8}{2\cdot(-1)+3}\right]=-9$$

в) $$\lim_{x\to \infty}\frac{x^2-7x-8}{2x^2+5x+3}=\lim_{x\to\infty}\frac{\cancel{x^2}\left(1-\frac{7}{x}-\frac{8}{x^2}\right)}{\cancel{x^2}\left(2+\frac{5}{x}+\frac{3}{x^2}\right)}=\frac{1}{2}$$

№5

$$\lim_{x\to 4}\frac{3-\sqrt{5+x}}{1-\sqrt{5-x}}=\left[\frac{3-\sqrt{5+4}}{1-\sqrt{5-4}}=\frac{3-3}{1-1}=\frac{0}{0}\right]=$$

$$=\lim_{x\to 4}\frac{(3-\sqrt{5+x})(3+\sqrt{5+x})(1+\sqrt{5-x})}{(1-\sqrt{5-x})(3+\sqrt{5+x})(1+\sqrt{5-x})}=$$

$$=\lim_{x\to 4}\frac{(9-(5+x))(1+\sqrt{5-x})}{(1-(5-x))(3+\sqrt{5+x})}=\lim_{x\to 4}\frac{\overset{-1}{\cancel{(4-x)}}(1+\sqrt{5-x})}{\cancel{(x-4)}(3+\sqrt{5+x})}=$$

$$=\left[\frac{-(1+\sqrt{5-4})}{3+\sqrt{5+4}}=-\frac{1+1}{3+3}\right]=-\frac{1}{3}$$

№6

$$\lim_{x\to 0}\frac{x^2\cdot \operatorname{ctg}2x}{\sin 3x}=\lim_{x\to 0}\frac{x^2\cdot\cos 2x}{\sin 3x\cdot\sin 2x}=\left[\frac{0}{0}\right]=$$

$$=\lim_{x\to 0}\frac{\overset{\to 1}{3x}\cdot\frac{1}{3}\cdot\overset{\to 1}{2x}\cdot\frac{1}{2}\cdot\overset{\to 1}{\cos 2x}}{\sin 3x\cdot\sin 2x}=\frac{1}{6}.$$