(Урок 4, задание 1)

а) $\lim\limits_{x\to 6} \dfrac{x^2-36}{x^2-x-30} = \dfrac{12}{11}$

б) $\lim\limits_{x\to 7} \dfrac{x^2-49}{x^2-13x+42} = 14$

в) $\lim\limits_{x\to 7} \dfrac{\sqrt{x+2}-\sqrt[3]{x+20}}{\sqrt[4]{x+9}-2} = \dfrac{1}{254}\left(3-8\sqrt{3}\right) = \dfrac{3-8\sqrt{3}}{254}$

$= -0{,}5405358$

г) $\lim\limits_{x\to 0} \dfrac{3x\,tg\,4x}{1-\cos 4x} = \dfrac{3}{2}\left(\dfrac{12x+tg^2 4x+12x+3tg\,4x}{4\cos 4x}\right)$

д) $\lim\limits_{x\to 0} \dfrac{\sqrt{2}\,x^2\sin 4x}{(1-\cos 2x)^{3/2}} = \dfrac{\sqrt{2}\,x^2\sin 4x}{\frac{1}{2}(1-\cos(2x))^3} =$

$= \dfrac{2\sqrt{2}\,x^2\sin 4x}{(1-\cos 2x)^3} = \dfrac{8\sqrt{2}\,x^2\cos 4x + 4\sqrt{2}\,x^2\sin 4x}{6\sin 2x\cdot\cos^2 2x - 12\sin 2x\cos 2x + 6\sin 2x}$

$= 4268712{,}08837285$