Lesson 4 Homework

① a) $\lim\limits_{x\to 6} \dfrac{x^2-36}{x^2-x-30} = \left(\dfrac{0}{0}\right) =$

$= \lim\limits_{x\to 6} \dfrac{(x-6)(x+6)}{(x-6)(x+5)} = \lim\limits_{x\to 6} \dfrac{x+6}{x+5} = \dfrac{6+6}{6+5} =$

$= \dfrac{12}{11}.$

$x^2-x-30 \mid x-6$

$-x^2-6x \quad\quad x+5$

$5x-30$

$-5x-30$

0

б) $\lim\limits_{x\to 7} \dfrac{x^2-49}{x^2-13x+42} = \left(\dfrac{0}{0}\right) = \lim\limits_{x\to 7} \dfrac{(x-7)(x+7)}{(x-7)(x+6)} =$

$= \lim\limits_{x\to 7} \dfrac{x+7}{x+6} = \dfrac{14}{13}$

$x^2-13x+42 \mid x-7$

$-x^2-7x \quad\quad x+6$

$6x+42$

$-6x-42$

0

2) $\lim\limits_{x\to 0} \frac{3x\,tg\,4x}{1+\cos 4x} = \left(\frac{0}{0}\right) = \frac{3x\cdot 4x}{1-4x} =$

$= \lim\limits_{x\to 0} \frac{12x^2}{1-4x} = 2$

e) $\lim\limits_{x\to\infty} \left(\frac{4x}{4x+3}\right)^{\frac{5x^2}{7x-1}} = (1)^{+\infty} =$

$\lim\limits_{x\to\infty} \left(\frac{4x-3+3}{4x-3}\right)^{\frac{5x^2}{7x-1}} =$

$\lim\limits_{x\to\infty} \left(1+\frac{3}{4x-3}\right)^{\frac{4x-3}{3}\cdot\frac{3}{4x-3}\cdot\frac{5x^2}{7x-1}} =$

$\to e$

$\lim\limits_{x\to\infty} e^{\frac{15x^2}{(4x-3)(7x-1)}} = e^{\frac{15x^2}{28x^2-4x-21x+3}} =$

$= \lim\limits_{x\to\infty} e^{\frac{15x^2}{28x^2-25x+3}} = \lim\limits_{x\to\infty} e^{\frac{15}{28}} =$

BRAUBERG www.brauberg.com