ΕΡΓΑΣΙΑ 2-Α!

① $\lim\limits_{x\to 1}\left(\frac{x^2-1}{x-1}\right) \overset{(5)}{=} \lim\limits_{x\to 1}\frac{(x-1)(x+1)}{x-1} = \lim\limits_{x\to 1}(x+1) = \boxed{2}$

② $\lim\limits_{x\to 1}\left(\frac{x^2}{x-1}-\frac{x}{x-1}\right) = \lim\limits_{x\to 1}\left(\frac{x^2-x}{x-1}\right) \overset{(3)}{=} \lim\limits_{x\to 1}\frac{x(x-1)}{x-1} = \lim\limits_{x\to 1} x = \boxed{1}$

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

	1	1	-2	1
		1	2	
	1	2	0	

④ $\lim\limits_{x\to 1}\frac{x-1}{\sqrt{x}-1} \overset{(5)}{=} \lim\limits_{x\to 1}\frac{(x-1)(\sqrt{x}+1)}{(\sqrt{x}-1)(\sqrt{x}+1)} = \lim\limits_{x\to 1}(\sqrt{x}+1) = \sqrt{1}+1 = \boxed{2}$

$(\sqrt{x}-1)(\sqrt{x}+1) = \sqrt{x}^2 - 1^2 = x-1$

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

⑥ $\lim\limits_{x\to 0}\frac{(x+1)^2-1}{(x+1)^2-4} = \lim\limits_{x\to 0}\frac{x^2+2x+1-1}{x^2+2x+1-4} = \lim\limits_{x\to 0}\frac{x^2+2x}{x^2+2x-3} = \lim\limits_{x\to 0}\frac{x(x+2)}{x(x+3)} = \frac{2}{3}$ ✗

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

	1	0	1	2	-1
		-1	1	-2	
	1	-1	2	0	

⑧ $\lim\limits_{x\to 0}\left(\sqrt{1+x}+\sqrt{1+x}\right) = \sqrt{1}+\sqrt{1} = 2$

⑨ $\lim\limits_{x\to 0}(\eta\mu x+\sigma\upsilon x) = \eta\mu 0+\sigma\upsilon 0 = 0+1 = 1$

⑩ $\lim\limits_{x\to -1}\frac{x^2-1}{3(x-1)} = \frac{(-1)^2-1}{3(-1-1)} = \frac{0}{-6} = 0$

⑪ $\lim\limits_{x\to 10}\left(\frac{x^2-100}{x-10}\right) \overset{(5)}{=} \lim\limits_{x\to 10}\frac{(x-10)(x+10)}{x-10} = 20$

⑫ $\lim\limits_{x\to 1}\left(\frac{3x^2+5x-8}{x-1}\right) = \lim\limits_{x\to 1}\frac{(x-1)(3x+8)}{x-1} = 11$

	3	5	-8	1
		3	8	
	3	8	0	

⑬ $\lim\limits_{x\to 2}\frac{x^4+4x-24}{x^3-8} \overset{(5)}{=} \lim\limits_{x\to 2}\frac{(x-2)(x^3+2x^2+4x+12)}{(x-2)(x^2+2x+4)} = \frac{36}{12} = 3$

	1	0	0	4	-24	2
		2	4	8	24	
	1	2	4	12	0	

	1	0	0	-8	2
		2	4	8	
	1	2	4	0	