Year: Mounth: Date: حل تمارین Subject : (

1) $\lim_{x\to 1} \frac{2x^2-7x+5}{3x^2-8x+5} = \frac{0}{0} \xrightarrow{H} \frac{4x-7}{6x-8} \to \frac{4-7}{6-8} = \frac{1}{2}$

2) $\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} = \frac{0}{0} \Rightarrow \frac{-3x+1-3x-1}{x} = \frac{-6x}{x} = -6$

3) $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \Rightarrow \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(\sqrt{x}-2)} = \sqrt{x}+2 = 4$

4) $\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-2} \to \frac{0}{0} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x^2-2x}{4(2x+3)(x-2)} = \frac{x(x-2)}{4(2x+3)} = \frac{2}{28} = \frac{1}{14}$

5) $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \to \frac{0}{0} \times \frac{5+\sqrt{5}}{5+\sqrt{5}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \frac{(1-x)\times 4}{(5-5+x)\times 2} = \frac{2(1-x)}{-(1-x)} = -2$

6) $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \to \frac{0}{0} \times \frac{3+\sqrt{3}}{3+\sqrt{3}} \times \frac{4+\sqrt{3x+4}}{4+\sqrt{3x+4}} = \frac{(3x+4-16)\times 27}{(5x+7-27)\times 8} = \frac{3(x-4)\times 27}{5(x-4)\times 8} = \frac{81}{40}$

7) $\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \to \frac{0}{0} \times \frac{3+\sqrt{3}}{3+\sqrt{3}} \times \frac{2+\sqrt{3x+\sqrt{x}}}{2+\sqrt{3x+\sqrt{x}}} = \frac{(3x+\sqrt{x}-4)\times 3}{(x-1)\times 4} \times \frac{(3x-4-\sqrt{x})}{(3x-4-\sqrt{x})} =$

$= \frac{(9x^2+17-24x-x)\times 3}{4(x-1)(3x-\sqrt{x}-4)} = \frac{(9x-17)(x-1)\times 3}{4(x-1)(3x-\sqrt{x}-4)} = \frac{-27}{-8} = \frac{27}{8}$

8) $\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} \to \frac{0}{0} = \frac{(1+\cos x)(1-\cos x+\cos^2 x)}{(1-\cos x)(1+\cos x)} = \frac{1-(-1)+(-1)^2}{1-(-1)} = \frac{3}{2}$

9) $\lim_{x\to \frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} \to \frac{0}{0} = \frac{\frac{\cos x-\sin x}{\cos x}}{-(\cos x-\sin x)} = \frac{1}{-\cos x} = \frac{1}{-\frac{\sqrt{2}}{2}} = \frac{-2}{\sqrt{2}} = -\sqrt{2}$

10) $\lim_{x\to \frac{\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} \to \frac{0}{0} = \frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{-(\sin^2 x-\cos^2 x)} = \frac{1}{-\cos^2 x} = \frac{1}{-(-\frac{\sqrt{2}}{2})^2} = \frac{1}{-\frac{1}{2}} = -2$

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