SUBJECT:

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11/5

آزادبخش نژاد مبینا خدا تکلیف 30

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

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

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

(۴) $\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} = \frac{x-\sqrt{2x}}{(x-2)(2x+3)} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x^2-2x}{(x-2)(2x+3)(x+\sqrt{2x})} = \frac{1}{14}$

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

(۶) $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{3(x-4)\left(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9\right)}{5(x-4)\left(\sqrt{3x+4}+4\right)} = \frac{81}{40}$

(۷) $\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{(\sqrt{x}-1)(3\sqrt{x}+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt{x}-1)(\sqrt{x}+1)(\sqrt{3x+\sqrt{x}}+2)} = \frac{21}{8}$

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

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

(۱۰) $\lim_{x\to \frac{3\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{0}{0} = \frac{(\tan x-1)(\tan x+1)}{(\cos x-\sin x)(\cos x+\sin x)} = \frac{-(\sin x-\cos x)(\cos x+\sin x)}{\cos^2 x(\cos x-\sin x)(\cos x+\sin x)} = \frac{-1}{\cos^2 x} = \frac{-1}{\frac{1}{2}} = -2$

Senobar

۴) $\lim_{x \to} \dfrac{1 - \dfrac{۲}{۲\sqrt{۲x}}}{۴x - ۱} = \dfrac{1}{۱۴}$