مهرزاد شوشتری

۱۹,۷۵

۳۵

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

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

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

۴) $\lim_{x\to 3} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} = \frac{x-\sqrt{2x}}{(x-2)(2x+3)} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x^2-2x}{(x-2)(2x+3)(x+\sqrt{2x})} = \frac{x(x-2)}{(x-2)(2x+3)(x+\sqrt{2x})} = \frac{2}{28}$ ✓

۵) $\lim_{x\to 4} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{\text{مزدوج صورت}}{\text{مزدوج صورت}} \times \frac{\text{مزدوج مخرج}}{\text{مزدوج مخرج}} = \frac{(1-x)(2+\sqrt{5-x})}{(4-5+x)(1+\sqrt{x})} = \frac{(1-x)(2+\sqrt{5-x})}{(x-1)(1+\sqrt{x})} = -2$ ✓

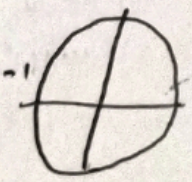
۱,۷۵

۶) $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{\text{مزدوج صورت}}{\text{مزدوج صورت}} \times \frac{\text{مزدوج مخرج}}{\text{مزدوج مخرج}} = \frac{3x+4-16}{5x+7-27} \times \frac{27}{8} = \frac{3x-12}{5x-20} \times \frac{27}{8}$

$\frac{3(x-4)}{5(x-4)} \times \frac{27}{8} = \frac{81}{40}$ ✓

۷) $\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}$ hop $\to \frac{3+\frac{1}{3\sqrt{x}}}{\frac{2\times 2}{1}} = \frac{3+\frac{1}{2}}{\frac{8}{1}} = \frac{\frac{7}{2}}{\frac{8}{1}} = \frac{7}{8} \to \sqrt{\frac{21}{5}}$ ✓

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



(9

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

(6)

$$\frac{-1}{\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} = -\frac{2\sqrt{2}}{2} = -\sqrt{2}$$

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

(7)

$$(-2)$$