نام و نام خانوادگی: ... پیشه‌ور ... تکلیف ۳۰

۲۰

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

جواب ۱

$$\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} = \frac{0}{0} \text{ مبهم}$$

$$\frac{-(3x-1)-(3x+1)}{x} = \frac{-3x+1-3x-1}{x} = \frac{-6x}{x} = -6$$

← جواب ۲

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

جواب ۳

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

$(x-2)(2x+3)$

$$\rightsquigarrow \frac{x(x-2)}{(x-2)(2x+3)(x+\sqrt{2x})} = \frac{2}{7\times 4} = \frac{2}{14}$$

← جواب ۴

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

$-(1-x)$

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

← جواب ۵

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}=\frac{0}{0}\;\to\;\times\frac{\text{مزدوج}}{\text{مزدوج}}=\frac{(3x+4-16)\,(\quad)}{(5x+7-27)\,(\quad)}$$

$$=\lim\frac{3(x-4)\left(\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}\right)}{5(x-4)\left(\sqrt{3x+4}+4\right)}\;\to\;\lim_{x\to 4}\frac{3(9+9+9)}{5(8)}=\boxed{\frac{81}{40}}$$ ← جواب (د) 6

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

$$=\lim_{x\to 1}\frac{3\cdot 3(\sqrt{x}-1)(\sqrt{x}+\frac{4}{3})}{4\left((\sqrt{x}-1)(\sqrt{x}+1)\right)}=\boxed{\frac{21}{8}}$$ ← جواب (د) 7

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

جواب

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\cot x}{\sin x-\cos x}=\frac{\frac{\cos x-\sin x}{\sin x}}{(\sin x-\cos x)}=\frac{(\cos x-\sin x)}{\sin\left(-(\cos x-\sin x)\right)}=\frac{1}{-\sin x}=\frac{1}{-\frac{\sqrt{2}}{2}}=\boxed{-\frac{2}{\sqrt{2}}}$$ (د) 9

جواب

$$\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2x-1}{\cos 2x}=\frac{(\tan x-1)(\tan x+1)}{(\cos x-\sin x)(\cos x+\sin x)}=\frac{-(\sin x+\cos x)(\cos x-\sin x)}{\cos^2x(\cos x-\sin x)(\cos x+\sin x)}=\frac{-1}{\cos^2x}=\frac{-1}{\frac{1}{2}}=\boxed{-2}$$ (د) 10

جواب