«ستوده مداری» شماره تکلیف، ۳۰، «یازدهم دختر B»

$$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3} \Rightarrow \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{4(x-\frac{3}{4})\cancel{(x-1)}}{5(x-\frac{3}{5})\cancel{(x-1)}} = \frac{4(\frac{1}{4})}{5(\frac{2}{5})} = \boxed{\frac{1}{2}}$$

حذف عامل صفرکننده (جایگذاری)

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$$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x} \Rightarrow \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{-(3x-1)-(3x+1)}{x} = \frac{-3x+1-3x-1}{x}$$

$$x\to 0 \Rightarrow 3x-1<0 \Rightarrow |3x-1| = -(3x-1) \Rightarrow \frac{-6x}{x} = \boxed{-6}$$

2

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$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{\sqrt{x}-2}} = \sqrt{x}+2 \underset{\text{جایگذاری}}{\Rightarrow} 2+2 = \boxed{4}$$

3

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$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6} \Rightarrow \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{2(x+\frac{3}{2})(x-2)} = \frac{\sqrt{x}\cancel{(\sqrt{x}-\sqrt{2})}}{2(x+\frac{3}{2})\cancel{(\sqrt{x}-\sqrt{2})}(\sqrt{x}+\sqrt{2})}$$

$$\frac{\sqrt{x}}{2(x+\frac{3}{2})(\sqrt{x}+\sqrt{2})} \overset{\text{جایگذاری}}{=} \frac{\sqrt{2}}{\cancel{2}(\frac{7}{\cancel{2}})(2\sqrt{2})} = \boxed{\frac{1}{14}}$$

4

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$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}} \Rightarrow \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}}$$

$$\frac{1-x}{\underbrace{4-(5-x)}_{-1+x}} \times \frac{4}{2} = \frac{2(1-x)}{x-1} = \frac{-2\cancel{(x-1)}}{\cancel{x-1}} = \boxed{-2}$$

5

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\Rightarrow\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}\times\frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4}$$

$$\frac{3x+4-16}{5x+7-27}\times\frac{27}{8}=\frac{3x-12}{5x-20}\times\frac{27}{8}=\frac{3(x-4)}{5(x-4)}\times\frac{27}{8}=\boxed{\frac{81}{40}}$$

6

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$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\Rightarrow\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}}\times\frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2}$$

$$\frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}=\frac{3(\sqrt{x}+\frac{4}{3})(\sqrt{x}-1)}{(\sqrt{x}-1)(\sqrt{x}+1)}=\frac{3(\frac{7}{3})\times 3}{2\times 4}=\boxed{\frac{21}{8}}$$

7

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$$\lim_{x\to \pi}\frac{1+\cos^3x}{\sin^2x}\Rightarrow\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{(1+\cos x)(1+\cos^2x-\cos x)}{1-\cos^2x}=\frac{(1+\cos x)(1-\cos x+\cos^2x)}{(1+\cos x)(1-\cos x)}$$

$$\sin^2x \Downarrow 1-\cos^2x$$

$-1$ 

$$\frac{\cos^2x-\cos x+1}{1-\cos x}=\frac{1-(-1)+1}{1-(-1)}=\boxed{\frac{3}{2}}$$

8

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$$\lim_{x\to \frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}\Rightarrow\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x}=\frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x}=\frac{-1}{\cos x}$$

 $\frac{\sqrt{2}}{2}$, $\frac{\sqrt{2}}{2}$

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

9

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$$\lim_{x\to \frac{3\pi}{4}}\frac{\tan^2x-1}{\cos 2x}\Rightarrow\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\frac{\sin^2x}{\cos^2x}-1}{\cos^2x-\sin^2x}=\frac{\frac{\sin^2x-\cos^2x}{\cos^2x}}{\cos^2x-\sin^2x}=\frac{-1}{\cos^2x}=$$

$-\frac{\sqrt{2}}{2}$, $\frac{\sqrt{2}}{2}$ 

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

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