نام و نام خانوادگی: [redacted] فاتح

حوزه: یازدهم دختر

شماره تکلیف: ۳۰

سوال ۱

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

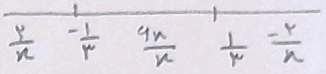
$$=\frac{4(1)-3}{5(1)-3}=\boxed{\frac{1}{2}}$$

سوال ۲

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

$$F(x)=\frac{9x}{x}=\boxed{9}$$

دوران نمودار



سوال ۳

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

سوال ۴

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6} \to \frac{2-\sqrt{2(2)}}{2(2)^2-2-6}=\frac{2-2}{8-2-6}=\frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(2x+3)(x-2)}=\frac{\sqrt{x}}{(2x+3)(\sqrt{x}+\sqrt{2})}$$

$$(x-2)=(\sqrt{x}-\sqrt{2})(\sqrt{x}+\sqrt{2})$$

$$\xrightarrow{x\to 2} \frac{\sqrt{2}}{(2(2)+3)(\sqrt{2}+\sqrt{2})}=\frac{\sqrt{2}}{7(2\sqrt{2})}=\frac{\sqrt{2}}{14\sqrt{2}}=\boxed{\frac{1}{14}}$$

سوال ۵

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}} \to \frac{1-\sqrt{1}}{2-\sqrt{5-1}}=\frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{0}{0}\times\frac{\text{مزدوج}}{\text{مزدوج}}=\frac{(1-x)}{2}\times\frac{4}{4-(5-x)}=\frac{2(1-x)}{(x-1)}=\boxed{-2}$$

سوال ۶

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \to \frac{\sqrt{3(4)+4}-4}{\sqrt[3]{5(4)+7}-3}=\frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{0}{0}\times\frac{\text{ف}}{\text{ف}}=\frac{(3x+4-16)}{8}\times\frac{27}{3(x-4)}$$

$$=\frac{3\times 27}{8\times 3}=\boxed{\frac{81}{40}}$$

سوال ۷

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

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

سوال ۸

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

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

سوال ۹

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

$$\xrightarrow{x\to\frac{\pi}{4}} \frac{-1}{\cos\frac{\pi}{4}}=\boxed{-\sqrt{2}}$$

سوال ۱۰

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

$$\xrightarrow{x\to\frac{3\pi}{4}} \frac{-1}{\cos^2\frac{3\pi}{4}}=\boxed{-2}$$