یازدهم دفتر C — نیا جمشیدی — تکلیف شماره ۳۰

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

۲)
$$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x}=\frac{0}{0}$$
$$1-3x-3x-1$$
$$\begin{cases}0^+\to \dfrac{(1-3x)-(3x+1)}{x}=\dfrac{-6\cancel{x}}{\cancel{x}}=-6\\[2ex] 0^-\to \dfrac{(1-3x)-(3x+1)}{x}=\dfrac{-6\cancel{x}}{\cancel{x}}=-6\end{cases}$$

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

۴)
$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}\times\frac{\text{مزدوج ص}}{\text{مزدوج ص}}=\frac{x^2-2x}{(2x^2-x-6)(4)}$$
$$\frac{0}{0}$$
$$=\frac{x\cancel{(x-2)}}{4\cancel{(x-2)}(2x+3)}=\frac{x}{4(2x+3)}\xrightarrow{x=2}\frac{2}{2\times 4\times 7}=\frac{1}{14}$$
s.a.m

۵)
$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\times\frac{\text{مم}}{\text{مم}}\times\frac{\text{مص}}{\text{مص}}=$$
$$\frac{0}{0}\quad\frac{(1-x)(4)^2}{4-(5-x)(2)}=\frac{2\cancel{(1-x)}}{\cancel{x-1}}$$
$$4-5+x=x-1$$
$$\Rightarrow\ =-2$$

۶)
$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\times\frac{\text{مص}}{\text{مص}}\times\frac{\text{فیلم}}{\text{فیلم}}=$$
$$\frac{(\cancel{3x+4-16})(27)}{(\cancel{5x+7-27})(8)}=\frac{3\cancel{(x-4)}(27)}{5\cancel{(x-4)}(8)}$$
$$3x-12\qquad 5x-20$$
$$\Rightarrow\ =\frac{81}{40}$$

۷)
$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\text{مص}}{\text{مص}}\times\frac{\text{فکم}}{\text{فکم}}$$
$$=\frac{(3x+\sqrt{x}-4)(3)}{(x-1)(4)}=\frac{\cancel{(\sqrt{x}-1)}(3\sqrt{x}+4)(3)}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}$$
$$\Rightarrow x=1\longrightarrow\frac{7(3)}{2}=\frac{21}{2}$$

۵

$$\lim_{x \to \pi} \frac{1+\cos^{۳} x}{\sin^{۲} x} = \frac{\cancel{(1+\cos x)}(1+\cos^{۲} x+\cos x)}{(1-\cos x)\cancel{(1+\cos x)}}$$

$\frac{0}{0}$, $\sin^{۲}x \to 1-\cos^{۲}x$

$x=\pi$

$$= \frac{1+\cos^{۲} x+\cos x}{1-\cos x} = \frac{1}{۲}$$

۹

$$\lim_{x \to \frac{\pi}{۴}} \frac{1-\tan x}{\sin x-\cos x} = \frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x} =$$

$\frac{0}{0}$

$$\frac{\frac{\cancel{\cos x-\sin x}}{\cos x}}{\frac{\cancel{\sin x-\cos x}}{1}} = \frac{-1}{\cos x} = \frac{-1}{\frac{\sqrt{۲}}{۲}}$$

$$= \frac{-۲}{\sqrt{۲}} = -\sqrt{۲}$$

۱۰

$$\lim_{x \to \frac{۳\pi}{۴}} \frac{\tan^{۲} x-1}{\cos ۲x} = \frac{\frac{\sin^{۲} x}{\cos^{۲} x}-1}{\cos^{۲} x-\sin^{۲} x} =$$

$$\frac{\frac{\cancel{\sin^{۲} x-\cos^{۲} x}}{\cos^{۲} x}}{\frac{\cancel{\cos^{۲} x-\sin^{۲} x}}{1}} = \frac{-1}{\cos^{۲} x} = \frac{-1}{\frac{1}{۲}} =$$

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