Subject:
Date

ریاضی ۱۵/ ۱/۱ کلاس شماره ۳۰

۱- $\lim_{x\to1}\frac{4x^2-7x+3}{5x^2-8x+3}=\frac{0}{0}$ مبهم $\longrightarrow \lim_{x\to1}\frac{(x-1)(4x-3)}{(x-1)(5x-3)}=\frac{4-3}{5-3}=\frac{1}{2}$

۲- $\lim_{x\to0}\frac{\underbrace{|3x-1|}_{-}-\underbrace{|3x+1|}_{+}}{x}=\frac{0}{0}$ مبهم $\longrightarrow \lim_{x\to0}\frac{1-3x-3x-1}{x}=\frac{-6x}{x}=-6$

۳- $\lim_{x\to4}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}$ مبهم $\longrightarrow \lim_{x\to4}\frac{(\cancel{\sqrt{x}-2})(\sqrt{x}+2)}{(\cancel{\sqrt{x}-2})}=2+2=4$

۴- $\lim_{x\to2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}$ مبهم $\xrightarrow{\times\text{مزدوج}} \lim_{x\to2}\frac{x^2-2x}{4(2x^2-x-6)}=\lim_{x\to2}\frac{x(\cancel{x-2})}{4(\cancel{x-2})(2x+3)}=\frac{1}{14}$

۵- $\lim_{x\to1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}=\frac{0}{0}$ مبهم $\frac{\times\text{مزدوج}}{\times\text{مزدوج}}\ \lim_{x\to1}\frac{4(1-x)}{2(4-5+x)}=\lim_{x\to1}\frac{2(\cancel{1-x})^{-1}}{\cancel{x-1}}=-2$

۶- $\lim_{x\to4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}=\frac{0}{0}$ مبهم $\xrightarrow[\times\text{مزدوج}]{\times\text{مزدوج}} \lim_{x\to4}\frac{27(3x+4-16)}{8(5x+7-27)}=\lim_{x\to4}\frac{27\times3(x-4)}{8\times5(x-4)}=\frac{81}{40}$

۷- $\lim_{x\to1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}$ مبهم $\xrightarrow{\times\text{مزدوج}} \lim_{x\to1}\frac{3x+\sqrt{x}-4}{4(\sqrt[3]{x}-1)}=\lim_{x\to1}\frac{3x+x^{\frac{1}{2}}-4}{4x^{\frac{1}{3}}-4}\ \underline{\text{hop}}\ \frac{3+\frac{1}{2}x^{-\frac{1}{2}}}{\frac{4}{3}x^{-\frac{2}{3}}}$

$=\frac{3+\frac{1}{2}}{\frac{4}{3}}=\frac{\frac{7}{2}}{\frac{4}{3}}=\frac{21}{8}$

۸- مبهم $\frac{0}{0}$

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

۹- $\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\lim_{x\to\frac{\pi}{4}}\frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x}=\frac{-1}{\cos x}=\frac{-1}{\frac{\sqrt{2}}{2}}=-\sqrt{2}$

مبهم $\frac{0}{0}$

۱۰- $\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2x-1}{\cos2x}=\frac{0}{0}$ مبهم $\longrightarrow \lim_{x\to\frac{3\pi}{4}}\frac{\frac{\sin^2x-\cos^2x}{\cos^2x}}{\cos^2x-\sin^2x}=\lim_{x\to\frac{3\pi}{4}}\frac{-1}{\cos^2x}=\frac{-1}{\frac{1}{2}}=-2$