نام و نام خانوادگی: کاوه سالاری دانی

تکلیف شماره ۳ کلاس یازدهم تجربی B

۱- $\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} \overset{H\circ P}{\Longrightarrow} \frac{8x-7}{10x-8} = \frac{8-7}{10-8} = \boxed{\frac{1}{2}}$

۲- $\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} = \frac{1-3x-3x-1}{x} = \frac{-6x}{x} \overset{H\circ P}{\Longrightarrow} \boxed{-6}$

۳- $\lim_{x\to 4} \frac{3-x}{\sqrt{x}-2} \overset{H\circ P}{\Longrightarrow} \frac{-1}{\frac{1}{2\sqrt{x}}} = \frac{-1}{\frac{1}{4}} = \boxed{-4}$

۴- $\lim_{x\to 2} \frac{x-\sqrt{3x}}{3x^2-x-6} \overset{H\circ P}{\Longrightarrow} \frac{1-\frac{3}{2\sqrt{3x}}}{6x-1} = \frac{1-\frac{1}{2}}{12-1} = \frac{\frac{1}{2}}{11} = \boxed{\frac{1}{22}}$

۵- $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \overset{H\circ P}{\Longrightarrow} \frac{-\frac{1}{2\sqrt{x}}}{-\frac{-1}{2\sqrt{5-x}}} = \frac{-1}{1} = \boxed{-1}$

۶- $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+11}-3} \overset{H\circ P}{\Longrightarrow} \frac{\frac{3}{2\sqrt{3x+4}}}{\frac{5}{3\sqrt[3]{(5x+11)^2}}} = \frac{\frac{3}{8}}{\frac{5}{27}} = \boxed{\frac{81}{40}}$

۷- $\lim_{x\to 1} \frac{\sqrt{x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \overset{H\circ P}{\Longrightarrow} \frac{\frac{1+\frac{1}{2\sqrt{x}}}{2\sqrt{x+\sqrt{x}}}}{\frac{1}{3\sqrt[3]{x^2}}} = \frac{\frac{3}{4}+\frac{1}{4}}{\frac{1}{3}} = \frac{1}{\frac{1}{3}} = \boxed{\frac{7}{12}}$

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

۹- $\lim_{x\to \frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} \overset{H\circ P}{\Longrightarrow} \frac{-1-\tan^2 x}{\cos x+\sin x} = \frac{-1-1}{\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}} = \frac{-2}{\sqrt{2}} = \frac{-2\sqrt{2}}{2} = \boxed{-\sqrt{2}}$

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