پاسخ به تکلیف ۲۰ کلاس دوشنبه ها

سوال ۱)

$$\lim_{x\to 1} \frac{x^2-3x+2}{3x^2-4x+1} \xrightarrow{H\text{ôp}} \frac{2x-3}{6x-4} = \frac{1}{2}$$

سوال ۲)

$$\lim_{x\to 0} \frac{|\sin x-1|-|\sin x+1|}{x} = \frac{1-\sin x-\sin x-1}{x} = \frac{-2\sin x}{x} = -2$$

سوال ۳)

$$\lim_{x\to 3} \frac{x-3}{\sqrt{x-2}-1} \xrightarrow{H\text{ôp}} \frac{1}{\frac{1}{2\sqrt{x-2}}} = 3$$

سوال ۴)

$$\lim_{x\to 2} \frac{x-\sqrt{3x-2}}{3x^2-x-6} \xrightarrow{H\text{ôp}} \frac{1-\frac{3}{2\sqrt{3x-2}}}{6x-1} = \frac{\frac{1}{2}}{11} = \frac{1}{22}$$

سوال ۵)

$$\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \xrightarrow{H\text{ôp}} \frac{-\frac{1}{2\sqrt{x}}}{-\frac{-1}{2\sqrt{5-x}}} = \frac{-\sqrt{5-x}}{\sqrt{x}} = -2$$

سوال ۶)

$$\lim_{x\to 3} \frac{\sqrt{3x+3}-3}{\sqrt[3]{5x+11}-4} \xrightarrow{H\text{ôp}} \frac{\frac{3}{2\sqrt{3x+3}}}{\frac{5}{3\sqrt[3]{(5x+11)^2}}} = \frac{\frac{3}{6}}{\frac{5}{3\times 9}} = \frac{9}{10}$$

سوال ۷)

$$\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \xrightarrow{H\text{ôp}} \frac{\frac{3+\frac{1}{2\sqrt{x}}}{2\sqrt{3x+\sqrt{x}}}}{\frac{1}{3\sqrt[3]{x^2}}} = \frac{\frac{7}{2}}{\frac{1}{3}} = \frac{7}{8}$$

سوال ۸)

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

سوال ۹)

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

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