نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$$\frac{0}{0} \to \frac{x^2-7x+12}{x^2-10x+16} \to \frac{(x-3)(x-4)}{(x-2)(x-8)} = \frac{x-3}{x-8} \xrightarrow{x\to 1} \frac{-2}{-7} = \frac{1}{7}$$

۲

$$0^+ \to \frac{3x-1-2x-1}{x} = \frac{-2}{x} = -\infty$$

$$0^- \to \frac{1-2x-3x-1}{x} = \frac{-5x}{x} = -5$$

۳

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

$\lim_{x\to 4}$

۴

$$\lim_{x\to 2} \frac{x-\sqrt{3x}}{\underbrace{3x^2-x-2}_{\downarrow}} \times \frac{x+\sqrt{3x}}{x+\sqrt{3x}} \to \frac{x^2-3x}{(3x+2)(x-2)(x+\sqrt{3x})} \to \frac{x(x-3)}{(3x+2)(x-2)(x+\sqrt{3x})}$$

$$(3x+2)(x-2)$$

$$= \frac{1}{14}$$

۵

$$\lim \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \frac{(1-\sqrt{x})(2+\sqrt{5-x})}{\underbrace{4-5+x}_{x-1}} = -2$$

$$(1+\sqrt{x})(1-\sqrt{x})$$

۶

$$\lim_{x\to 2} \frac{\sqrt{3x+2}-2}{\sqrt[3]{5x+2}-3} \times \frac{\sqrt{3x+2}+2}{\sqrt{3x+2}+2} \times \frac{\sqrt[3]{(5x+2)^2}+9+3\sqrt[3]{5x+2}}{11}$$

$$= \frac{3x+2-16}{5x+2-27} \times \frac{6^2}{16} = \frac{11}{20}$$

۷

$$\frac{0}{0} \to \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2} \times \frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}} \to \frac{3}{2} \times \frac{5}{3} = \frac{5}{2}$$

۸

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

۹

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

۱۰

$$\lim \frac{\tan^2 x-1}{\cos^2 x} \to \frac{\frac{\sin^2 x}{\cos^2 x}-\frac{\cos^2 x}{\cos^2 x}}{\cos^2 x} = \frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\cos^2 x} = \frac{-1}{\cos^2 x}$$

$$= \frac{-1}{1/4} \quad (=-4)$$