Date:　　　　Subject: مریم کسائیان

۲۰

تکلیف: ۳۰

① $\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{(x-1)(4x-3)}{(x-1)(5x-3)} = \boxed{\frac{1}{2}}$

دو ریشه $\rightarrow a+b+c=0$

② $\lim_{x\to 0} \frac{|2x-1|-|2x+1|}{x} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{-2x+1-2x-1}{x} = \frac{-4x}{x} = \boxed{-4}$

(منفی، مثبت)

③ $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{x-4}{\sqrt{x}-2} \times \frac{\sqrt{x}+2}{\sqrt{x}+2} = \frac{4(x-4)}{x-4} = \boxed{4}$

④ $\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{x-\sqrt{2x}}{(x-2)(2x+3)} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x^2-2x}{4(x-2)(2x+3)} = \frac{x(x-2)}{4(x-2)(2x+3)} = \boxed{\frac{1}{14}}$

روش ضرب a: $x^2-x-12=0 \rightarrow (x-4)(x+3)=0 \rightarrow x=\frac{4}{2}=2,\ x=-\frac{3}{2}$

⑤ $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \frac{4(1-x)}{2(x-1)} = \boxed{-2}$

$4-5+x$

⑥ $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4} \times \frac{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}$

$\frac{27(3x+4-16)}{8(5x+7-27)} = \frac{3(x-4)27}{5(x-4)8} = \frac{81}{40}$

⑦ $\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \dots = \frac{(3x+\sqrt{x}-4)3}{(x-1)4}$ ، $a+b+c=0$

$\frac{(\sqrt{x}-1)(3\sqrt{x}+4)\times 3}{(\sqrt{x}-1)(\sqrt{x}+1)\times 4} = \frac{7\times 3}{2\times 4} = \frac{21}{8}$

⑧ $\lim_{x\to \pi} \frac{1+\cos^3 x}{\sin^2 x} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{(1+\cos^2 x-\cos x)(1+\cos x)}{(1-\cos x)(1+\cos x)} = \frac{3}{2}$

$\sin^2 x \rightarrow (1-\cos^2 x)$

$$\lim_{x \to \frac{\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} = \frac{0}{0} \quad \text{(هوپیتال)} \quad (10)$$

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

$$\lim_{x \to \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x} = \frac{0}{0} \quad \text{(هوپیتال)} \quad (9)$$

$$\frac{\frac{-1}{\cos x - \sin x}}{\frac{\sin x - \cos x}{\cos x}} = \frac{-1}{\cos x} = \frac{-1}{\frac{\sqrt{2}}{2}} = \frac{-2}{\sqrt{2}} = -\sqrt{2}$$