نام و نام خانوادگی: رزا صمدی (۲۰) تمارین تکلیف: ۳۵ کلاس: سه کنکوری‌های دختر یازدهم

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

۲) $\lim_{x\to 0} \frac{|1+x^3|-|1-x^3|}{x} = \frac{0}{0} \longrightarrow \frac{-(1+x^3)-(1-x^3)}{x} = \frac{-1-x^3+1-x^3}{x} = \frac{-2x^3}{x} = \boxed{-2}$

۳) $\lim_{x\to 3} \frac{x-3}{x^2-2x-3} = \frac{0}{0} \longrightarrow \frac{(x-3)(x+1)}{(x-3)(x+1)} = \boxed{4}$

۴) $\lim_{x\to 2} \frac{x-\sqrt{3x-2}}{2x^2-x-6} = \frac{0}{0} \longrightarrow \times \frac{x+\sqrt{3x-2}}{x+\sqrt{3x-2}} = \frac{x(x-2)}{(2x+3)(x-2)(x+\sqrt{3x-2})} = \frac{2}{8\times 4} = \boxed{\frac{1}{16}}$

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

۶) $\lim_{x\to 2} \frac{\sqrt{5x+6}-3}{\sqrt{4x+8}-4} = \frac{0}{0} \longrightarrow$ ضرب در مزدوج $= \frac{(\sqrt{5x+6}-3)(\sqrt{5x+6}+3)(\sqrt{4x+8}+4)}{(\sqrt{4x+8}-4)(\sqrt{4x+8}+4)(5x+6+9)}$

$= \frac{(5x-15)(\sqrt{4x+8}+4)}{(4x-8)(5x+15)} = \frac{5(x-3)\times 8}{4(x-2)\times 5\times 3} = \frac{40}{12} = \boxed{\frac{10}{3}}$ ۶

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۸) $\lim_{x\to 1} \frac{\sqrt{2-\sqrt{x}+\sqrt{x}}}{1-\sqrt{x}} \times \frac{\sqrt{2+\sqrt{x}+\sqrt{x}}}{2+\sqrt{x}+\sqrt{x}} \times \frac{1+\sqrt{x}+\sqrt{x}}{1+\sqrt{x}+\sqrt{x}} = \frac{(2+\sqrt{x}+\sqrt{x})(3-\sqrt{x}+\sqrt{x})}{(1-x)(2+\sqrt{x}+\sqrt{x})}$

$= \lim_{x\to 1} \frac{(1+\sqrt{x})(1-\sqrt{x})^2}{(1-x)(\frac{3}{2}+\sqrt{x})} = \boxed{\frac{0}{12}}$ ۶

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۷) $\lim_{x\to \pi} \frac{1+\cos^3 x}{\sin^2 x} = \frac{(1+\cos x)(1+\cos^2 x-\cos x)}{1-\cos^2 x} = \frac{(1+\cos x)(1+\cos^2 x-\cos x)}{(1-\cos x)(1+\cos x)} = \frac{1+1+1}{2} = \boxed{\frac{3}{2}}$ ۶

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۹) $\lim_{x\to \frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} = \frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x} = \frac{\cos x-\sin x}{\cos x(\sin x-\cos x)} = \frac{1}{-\sin\left(\frac{\pi}{4}\right)} = \frac{1}{-\frac{\sqrt{2}}{2}} = \boxed{-\frac{2\sqrt{2}}{2}}$ ۶

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۱۰) $\lim_{x\to \frac{\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{(\tan x-1)(\tan x+1)}{(\cos x-\sin x)(\cos x+\sin x)} = \frac{-(\sin x+\cos x)(\cos x-\sin x)}{(\cos x-\sin x)(\cos x+\sin x)} = \frac{-1}{\cos\left(\frac{\pi}{2}\right)} = \frac{-1}{0} = \boxed{-2}$ ۶