

تکلیف شماره ۱

یا در دفتر

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$$\lim_{x \rightarrow 1} \frac{x^2 - \sqrt{x} + 2}{x^2 - 1x + 2} = \frac{0}{0} \Rightarrow \frac{(x-1)(x+c)}{(x-1)(4x-c)} = \frac{1}{2}$$

سوال (1)

$$\lim_{x \rightarrow 0} \frac{|x-1| - |x+1|}{x} = \frac{0}{0} \Rightarrow \frac{-x+1 - x-1}{x} = -2$$

سوال (2)

$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \Rightarrow \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{\sqrt{x}-2} = \sqrt{x}+2 = \boxed{6}$$

سوال (3)

$$\lim_{x \rightarrow 2} \frac{x - \sqrt{x}}{x^2 - x - 6} = \frac{0}{0} \Rightarrow \frac{x - \sqrt{x}}{x} = \frac{x^2 - 2x}{(x-2)(2x+6)} = \frac{2}{2x} = \frac{1}{x}$$

سوال (4)

$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{1 - \sqrt{5-x}} = \frac{0}{0} \Rightarrow \frac{1 + \sqrt{x}}{1 + \sqrt{5-x}} \times \frac{1 + \sqrt{x}}{1 + \sqrt{x}} = \frac{1-x}{x} \times \frac{1-x}{x-1} = \boxed{-2}$$

سوال (5)

$$\lim_{x \rightarrow 1} \frac{\sqrt{x+1} - 1}{\sqrt{5x+1} - 2} = \frac{0}{0} \Rightarrow \frac{\sqrt{x+1} + 1}{\sqrt{5x+1} + 2} \times \frac{\sqrt{x+1} + 1}{\sqrt{x+1} + 1} = \frac{2(x+1)}{5(x+1) + 2} = \frac{2}{7}$$

سوال (6)

$$\lim_{x \rightarrow 1} \frac{\sqrt{x+\sqrt{x}} - 2}{\sqrt{x} - 1} = \frac{0}{0} \Rightarrow \frac{\sqrt{x+\sqrt{x}} + 2}{\sqrt{x} + 1} \times \frac{\sqrt{x+\sqrt{x}} + 2}{\sqrt{x+\sqrt{x}} + 2} = \frac{x+\sqrt{x}-4}{x-1} = \frac{(x-1)(x+2)}{x-1} = x+2 = \frac{21}{1}$$

سوال (7)

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

سوال (8)

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

سوال (9)

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

سوال (10)