هستی باقری — تکلیف شماره ی (۱) ۳ — یازدهم تجربی

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(۱)

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

$$=\frac{(4\times 1)-3}{(5\times 1)-3}=\frac{1}{2}$$

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(۲)

$$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x}=\frac{-3x+1-3x-1}{x}=\frac{-6x}{x}=-6$$

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(۳)

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

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(۴)

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{x}\,\cancel{(\sqrt{x}-\sqrt{2})}}{\cancel{(\sqrt{x}-\sqrt{2})}(\sqrt{x}+\sqrt{2})(2x+3)}$$

$$=\frac{\cancel{\sqrt{2}}}{2\cancel{\sqrt{2}}\times 7}=\frac{1}{14}$$

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(۵)

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

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

(۶

$$\lim_{x\to ۴} \frac{\sqrt{۳x+۴}-۴}{\sqrt[۳]{۵x+۷}-۳} = \frac{۰}{۰} \xrightarrow{\text{رفع ابهام}}$$

$$\frac{\sqrt{۳x+۴}-۴}{\sqrt[۳]{۵x+۷}-۳} \times \frac{\sqrt{۳x+۴}+۴}{\sqrt[۳]{(۵x+۷)^۲}+۹+۳\sqrt[۳]{۵x+۷}} \times \frac{۳\times ۹}{۸}$$

$$= \frac{۳x+۴-۱۶}{۵x+۷-۲۷} \times \frac{۲۷}{۸} = \frac{\overset{۳}{\cancel{۳x-۱۲}}}{\underset{۵}{\cancel{۵x-۲۰}}} \times \frac{۲۷}{۸} = \frac{۸۱}{۴۰}$$

(۷

$$\lim_{x\to ۱} \frac{\sqrt{۳x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱} = \frac{۰}{۰} \xrightarrow{\text{رفع ابهام}}$$

$$\frac{\sqrt{۳x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱} \times \frac{\sqrt{۳x+\sqrt{x}}+۲}{\sqrt[۳]{x^۲}+۱+\sqrt[۳]{x}} \times \frac{۳}{۴} = \frac{۳x+\sqrt{x}-۴}{x-۱} \times \frac{۳}{۴}$$

$$= \frac{(۳\sqrt{x}+۴)\cancel{(\sqrt{x}-۱)}}{\cancel{(\sqrt{x}-۱)}(\sqrt{x}+۱)} \times \frac{۳}{۴} = \frac{۷}{۲} \times \frac{۳}{۴} = \frac{۲۱}{۸}$$

(۸

$$\lim_{x\to \pi} \frac{۱+\cos^۳ x}{\underbrace{\sin^۲ x}_{۱-\cos^۲ x}} = \frac{۰}{۰} \xrightarrow{\text{رفع ابهام}} \frac{\cancel{(۱+\cos x)}(۱+\cos^۲ x-\cos x)}{\cancel{(۱+\cos x)}(۱-\cos x)}$$

$$= \frac{۱+(-۱)^۲-(-۱)}{۱-(-۱)} = \frac{۳}{۲}$$

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(9)

$$\lim_{x\to\frac{\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x} = \frac{\frac{\cancel{\cos x-\sin x}}{\cos x}}{\underbrace{\cancel{\sin x-\cos x}}_{-1}}$$

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

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(10)

$$\lim_{x\to\frac{3\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}} \frac{\frac{1-\cos 2x}{1+\cos 2x}-1}{\cos 2x}$$

$$= \frac{\frac{\overbrace{\cancel{1-\cos 2x-1-\cos 2x}}^{\overset{-2}{\cancel{-2\cos 2x}}}}{1+\cos 2x}}{\cancel{\cos 2x}} = \frac{-2}{1+\cos 2x} = \frac{-2}{1+0} = -2$$