فرزانه آقائی — تکلیف شماره ی 30 — یازدهم دفتر c

1. $$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3}\longrightarrow\frac{\cancel{(x-1)}(4x-3)}{\cancel{(x-1)}(5x-3)}\longrightarrow\frac{1}{2}$$

2. $$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x}$$

$0^+ \longrightarrow \dfrac{\cancel{3x}-1-\cancel{3x}-1}{x}=\dfrac{-2}{0^+}=-\infty$

$0^- \longrightarrow \dfrac{\cancel{1}-3x-3x-\cancel{1}}{0^-}=\dfrac{-6x}{0^-}=-\infty$

3. $$\lim_{x\to 4^+}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}$$

$$\frac{(\sqrt{x}+2)\cancel{(\sqrt{x}-2)}}{\cancel{\sqrt{x}-2}}=4$$

4. $$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}\longrightarrow\frac{\overset{x\cancel{(x-2)}}{x^2-2x}}{\frac{\cancel{(2x-4)}(x+\frac{3}{2})}{2}}\times\frac{1}{4}=\frac{4}{\frac{8\times 7}{4\cdot 2}}=$$

$$2x^2-x-6\Rightarrow 4x^2-2x-12=(2x-4)(x+\tfrac{3}{2})$$

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

5. $$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}=\frac{0}{0}\longrightarrow\frac{1-x}{4-5+x}\times\frac{4}{2}=2\times\frac{\overset{-1}{\cancel{1-x}}}{\cancel{x-1}}=-2$$

hop $\longrightarrow \dfrac{-\frac{1}{2\sqrt{x}}}{+\frac{1}{2\sqrt{5-x}}}=\dfrac{-\frac{1}{2}}{+\frac{1}{4}}=-2$

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\longrightarrow\frac{0}{0}$$ .6

$$\xrightarrow{\text{hop}}\ \frac{\dfrac{3}{2\sqrt{3x+4}}}{\dfrac{5}{3\sqrt[3]{(5x+7)^2}}}=\frac{\dfrac{3}{8}}{\dfrac{5}{27}}=\frac{81}{40}$$

$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}\rightarrow\frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}=\frac{0}{0}\rightarrow$$ .7

$$\xrightarrow{\text{hop}}\ \frac{3+\dfrac{1}{2\sqrt{x}}}{1}\times\frac{3}{4}\rightarrow\frac{7}{2}\times\frac{3}{4}=\frac{21}{8}$$

$$\lim_{x\to\pi}\frac{1+\cos^3 x}{\sin^2 x}=\frac{0}{0}\rightarrow\frac{\cancel{(1+\cos x)}(1+\cos^2 x-\cos x)}{(1-\cos x)\cancel{(1+\cos x)}}\rightarrow$$ .8

$$\frac{3}{2}$$

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}\rightarrow\frac{\dfrac{\overset{-1}{\cancel{\cos x-\sin x}}}{\cos x}}{\cancel{\sin x-\cos x}}=-\frac{1}{\cos x}=-\frac{1}{\frac{\sqrt{2}}{2}}$$ .9

$$-\frac{2}{\sqrt{2}}=-\frac{\cancel{2}\sqrt{2}}{\cancel{2}}=-\sqrt{2}$$

10.

$$\lim_{x\to \frac{۳\pi}{۴}} \frac{\tan^{۲} x - 1}{\cos ۲x} = \frac{0}{0} \to \frac{\frac{\overset{-1}{\cancel{\sin^{۲} x-\cos^{۲} x}}}{\cos^{۲} x}}{\cancel{\cos^{۲} x - \sin^{۲} x}} = -\frac{1}{\cos^{۲} x} = -۲$$