

$$\lim_{x \rightarrow -r^+} r \left[\frac{r-x}{r} \right] + a \left[\frac{x+r}{r} \right] = \lim_{x \rightarrow -r^-} r \left[\frac{r-x}{r} \right] + a \left[\frac{x+r}{r} \right]$$

$$r \times \frac{2}{r} + a \times 0 = r \times 2 - a \Rightarrow a = 9 \Rightarrow \left[\frac{a}{r} \right] = 2$$

$$x < \frac{\pi}{9} \Rightarrow \sin x < \frac{1}{9} \Rightarrow r \sin x - 1 < 0$$

سؤال ٢

$$\Rightarrow \lim_{x \rightarrow \frac{\pi}{9}^-} [r \sin x - 1] = -1$$

سؤال ٣

$$\lim_{x \rightarrow -\frac{1}{r}} [\lambda x^r - x]$$

$$x = -\frac{1}{r} \Rightarrow \lambda x^r - x = \lambda x \frac{1}{\lambda} + \frac{1}{r} = -\frac{1}{r} \quad \text{چون صحيح نسب}$$

$$\Rightarrow \lim_{x \rightarrow -\frac{1}{r}} [\lambda x^r - x] = \lim_{x \rightarrow -\frac{1}{r}} \left[-\frac{1}{r} \right] = -1$$

$$x < -\frac{1}{r} \Rightarrow -x > \frac{1}{r} \Rightarrow x^r > \frac{1}{r} \Rightarrow \frac{1}{x^r} < r$$

سؤال ١٤

$$\Rightarrow \frac{r}{x^r} < 12$$

$$\Rightarrow \frac{r}{x^r} > -1$$

$$\lim_{x \rightarrow -\frac{1}{r}^-} \frac{\ln x + \left[\frac{r}{x^r} \right]}{\ln x - \left[-\frac{r}{x^r} \right]} = \lim_{x \rightarrow -\frac{1}{r}^-} \frac{\ln x + 11}{\ln x + 1} = \frac{1}{0^-} = -\infty$$

$$\lim_{x \rightarrow 1^+} \frac{\sin^2 \pi x}{[x] + \cos \pi x} = \lim_{x \rightarrow 1^+} \frac{\sin^2 \pi x}{1 + \cos \pi x} = \frac{0}{0}$$

سؤال ١٥

$$(h.l.z): \lim_{x \rightarrow 1^+} \frac{\sin^2 \pi x}{1 + \cos \pi x} = \lim_{x \rightarrow 1^+} \frac{\sin^2 (\pi - \pi x)}{1 + \cos \pi x} = \lim_{x \rightarrow 1^+} \frac{(\pi - \pi x)^2}{1 + \cos \pi x}$$

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

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$$\lim_{n \rightarrow -1} \frac{\sqrt{2n+3} - \sqrt{2n+5}}{1 + \sqrt[3]{n}} \times \frac{\sqrt{2n+3} + \sqrt{2n+5}}{\sqrt{2n+3} + \sqrt{2n+5}} \times \frac{\sqrt[3]{n} + \sqrt[3]{n+1}}{\sqrt[3]{n} - \sqrt[3]{n+1}} \quad (\text{سؤال 6})$$

$$= \frac{-n-1}{n-1} \times \frac{\sqrt[3]{n}}{\sqrt[3]{n+1}} = 0$$

$$\lim_{n \rightarrow 1} \frac{2n - \sqrt{2n+1}}{2n - \sqrt{2n+1}} \stackrel{\text{Hop}}{=} \lim_{n \rightarrow 1} \frac{2 - \frac{1}{\sqrt{n}}}{2 - \frac{1}{\sqrt{2n+1}}} = -\frac{1}{2} \quad (\text{سؤال 7})$$

$$\text{مخرج} = 0 \Rightarrow \text{عدد} = 0 \Rightarrow a + \sqrt{c} = 0 \Rightarrow a = -\sqrt{c} \quad (\text{سؤال 8})$$

$$\lim_{n \rightarrow 0} \frac{a + \sqrt{bn+c}}{n} \stackrel{\text{Hop}}{=} \lim_{n \rightarrow 0} \frac{\frac{b}{\sqrt{bn+c}}}{1} = \frac{b}{\sqrt{c}} = \frac{1}{5} \Rightarrow b = \frac{\sqrt{c}}{5}$$

$$\Rightarrow \frac{ab}{c} = \frac{\frac{\sqrt{c}}{5} \times -\sqrt{c}}{c} = -\frac{1}{5}$$

$$\lim_{x \rightarrow \frac{\pi}{2}^+} \frac{\frac{\pi}{2} + K[\frac{x}{\pi}]}{\sin x} = \frac{\frac{\pi}{2} - 2K}{0^+} = +\infty \Rightarrow \frac{\pi}{2} - 2K > 0 \quad (\text{سؤال 9})$$

$$\lim_{x \rightarrow \frac{\pi}{2}^-} \frac{\frac{\pi}{2} + K[\frac{x}{\pi}]}{\sin x} = \frac{\frac{\pi}{2} - 2K}{0^-} = +\infty \Rightarrow \frac{\pi}{2} - 2K < 0$$

$$\Rightarrow \frac{\pi}{2} < K < \frac{\pi}{2} \Rightarrow \frac{\pi}{2} - K > -\frac{\pi}{2}$$

$$\Rightarrow [-K] = -\frac{\pi}{2}$$

$$\text{عدد} = 0 \Rightarrow \text{مخرج} = 0 \Rightarrow \lambda a - b = 0 \Rightarrow \lambda a = b \quad (\text{سؤال 10})$$

$$\lim_{n \rightarrow 1} \frac{b\sqrt{2+\sqrt{n}} - 2b}{an - b} \stackrel{\text{Hop}}{=} \frac{b \frac{\frac{1}{2\sqrt{2+\sqrt{n}}}}{2\sqrt{2+\sqrt{n}}}}{a} = \frac{b}{a} \times \frac{1}{2} = \frac{\lambda a}{a} \times \frac{1}{2} = \frac{1}{4}$$

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