

$$\frac{f(x_0 + \Delta)}{x_0 + 1} = \frac{9}{4} = \frac{9}{4}$$

$$\left(\frac{f(x_0 + \Delta)}{x_0 + 1} = \frac{9}{4} = \frac{9}{4} \right) \text{ الف)$$

$$\frac{f(x_0 + \Delta)}{x_0 + 1} \begin{cases} \nearrow \Delta^+ \\ \searrow \Delta^- \end{cases}$$

$$\left(\frac{f(x_0 + \Delta)}{x_0 + 1} = \frac{9}{4} \right) \text{ ج)$$

$$\lim_{x \rightarrow 0} [f(x) + 1] = [10] = 9 \quad \text{ب)}$$

$$\lim_{x \rightarrow 0} f(x) + 1 = 9 \quad \text{الف)}$$

$$[\lim_{x \rightarrow 0} f(x) + 1] = 10 \quad \text{د)}$$

$$[\lim_{x \rightarrow 0} f(x) + 1] = 10 \quad \text{ج)}$$

$$\lim_{x \rightarrow 0} \left[\frac{f(x) - 1}{x} \right] = \left[\frac{10}{x} \right] = \frac{10}{x} \quad \text{ب)}$$

$$\lim_{x \rightarrow 0} \frac{f(x) + 1}{x} = \frac{1}{x} \quad \text{الف)}$$

$$\left[\lim_{x \rightarrow 0} \frac{f(x) + 1}{x} \right] = \infty \quad \text{د)}$$

$$\left[\lim_{x \rightarrow 0} \frac{f(x) + 1}{x} \right] = \infty \quad \text{ج)}$$

$$\text{الف)} \quad \lim_{x \rightarrow \infty} \frac{x - \infty}{x^2 - 9x + \infty} = \frac{\infty - \infty}{(\infty - \infty)(\infty - 1)}$$

$$\begin{array}{c} \infty \\ + \quad - \quad + \\ \hline \infty \end{array} \quad \begin{array}{c} + \\ - \\ + \end{array} \quad \begin{array}{c} \infty \\ + \\ - \\ + \end{array} \quad \begin{array}{c} \infty \\ + \\ - \\ + \end{array}$$

$$\text{ب)} \quad \lim_{x \rightarrow \infty} \frac{x - \infty}{x^2 - 9x + \infty} \rightarrow \frac{x - \infty}{(x - 9)^2} \rightarrow \frac{\infty}{\infty}$$

$$\begin{array}{c} \infty \\ + \quad - \quad + \\ \hline \infty \end{array} \quad \begin{array}{c} \infty \\ + \\ - \\ + \end{array} \quad \begin{array}{c} \infty \\ + \\ - \\ + \end{array}$$

$$\lim_{x \rightarrow \infty} [-f(x)] = [\infty] \rightarrow -\infty^+ = 1 + \infty = \infty$$

$$-\infty^- = 1 + \infty = \infty$$

$$\text{الف)}$$

$$\ln \left[\frac{-1}{x^6} \right] \rightarrow x < -\frac{1}{19} \Rightarrow \frac{1}{x^6} > -5 \rightarrow \frac{1}{x^6} < 19$$

(c) (a)

$$-\frac{1}{x^6} > -19 \rightarrow [-19] = -19$$



$$\lim_{x \rightarrow 1} [x^2 - 3x^2 + 3]$$

$$x \rightarrow 1$$

$$1^- \rightarrow [x^-] = 2$$

$$1^+ \rightarrow [x^+] = 2$$

(6) الف

$$\lim [x_0^{\epsilon} - x_0^{\kappa} + x_0^{\epsilon}]$$

$$i^+ \rightarrow [x^-] = x^0$$

$$i^+ \rightarrow [x^-] = x^0$$

cc/s

$$\lim_{x \rightarrow \infty} \frac{|x^2 - 1|}{x^2 - 1}$$

$$x^+ \rightarrow \frac{1}{x} = x$$

$$x^+ \rightarrow -\frac{1}{x} = -x$$

(ج) (✓)

$$\lim_{x \rightarrow \infty} \frac{|\sin x|}{\sin x}$$

$$x_+ \rightarrow \frac{-\sin x}{\sin x} = \frac{-1}{-1} = 1$$

(✓)

$$x^- \rightarrow \frac{\sin x}{\sin x} = \frac{1}{-1} = -1$$

~~(sin) (sin x)~~

$$\lim_{x \rightarrow 0} \sqrt{\cos x}$$

$$\frac{x_0^+}{x} = \sqrt{0^+} = 0$$

(ج) (✓)

$$\frac{x_0^-}{x} = \sqrt{0^-} = \text{X}$$

$$\lim_{x \rightarrow 0} \sqrt{x - \sqrt{x}}$$

$$0^+ \rightarrow \sqrt{x} > \sqrt{x} \text{ X}$$

(✓)

$$0^- \rightarrow \sqrt{x} \text{ X}$$



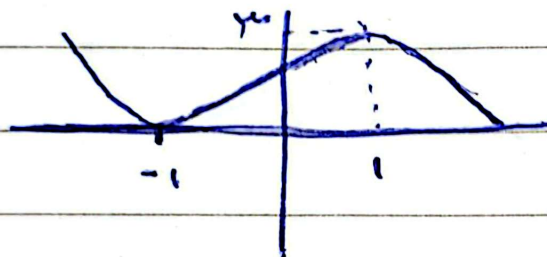
$$\lim_{x \rightarrow 0} \frac{\sin x}{x^2 - x} = \frac{(-1)}{x^2 x^r (x-1)} = \frac{1}{0^-} = \infty$$

(الف) 9

$$10 \quad \lim_{x \rightarrow r} \frac{x^r - [x^r]}{x - [x]} \quad r^+ \rightarrow \frac{(x-r)(x+r)}{x-r} = x+r = r \quad (✓)$$

$$r^- \rightarrow \frac{x^r - r^r}{x - r} = r$$

$$15 \quad x^r - rx^r + r \rightarrow 1 \text{ as } x \rightarrow 1 \quad 1 \text{ as } x \rightarrow 1 \quad 1 \text{ as } x \rightarrow 1 \quad 1 \text{ as } x \rightarrow 1 \quad (الف) 16$$



$$20 \quad x^r - rx^r + r \rightarrow rx^r - rx + rx(x^r - 1) = 0 \rightarrow 0 \text{ as } x \rightarrow 1 \quad (✓)$$

