

B. دارم دفتر

خوبه اولی

①

الف) $\lim_{x \rightarrow 2^+} \frac{x+5}{x+1} = 3$

ب) $\lim_{x \rightarrow 2^+} \frac{x+5}{x+1} = 3$

ج) $\lim_{x \rightarrow 2} \frac{x+5}{x+1} = 3$

د) $\lim_{x \rightarrow 0} \frac{x+7}{x^2} = \frac{x+7}{0^+} \Rightarrow$ کسری نشود

②

الف) $\lim_{x \rightarrow 2} f(x) - 2 = f(2) - 2 = 9$

ب) $\lim_{x \rightarrow 2} [f(x) - 2] = [f(2)] - 2 = 11 - 2 = 9$

ج) $\left| \lim_{x \rightarrow 2} f(x) - 2 \right| = 10$

د) $\left| \lim_{x \rightarrow 2^+} f(x) - 2 \right| = 10$

③

الف) $\lim_{x \rightarrow 5} \frac{3[x]+1}{2} = \frac{16}{2}$

ب) $\lim_{x \rightarrow 5} \left\lfloor \frac{3x+1}{2} \right\rfloor = \left\lfloor \frac{16}{2} \right\rfloor = 8$

ج) $\left\lceil \lim_{x \rightarrow 5} \frac{3x+1}{2} \right\rceil = 8$

د) $\left\lceil \lim_{x \rightarrow 5^+} \frac{3x+1}{2} \right\rceil = 8$

④

الف) $\lim_{x \rightarrow 1} \frac{x-5}{(x-5)(x-1)} = \frac{1}{x-1} \begin{cases} 1^+ \Rightarrow \frac{1}{0^+} = +\infty \\ 1^- \Rightarrow \frac{1}{0^-} = -\infty \end{cases}$

ب) $\lim_{x \rightarrow 3} \frac{x-2}{(x-3)^2} = \frac{x-2}{0^+} = \frac{-1}{0^+} = -\infty$

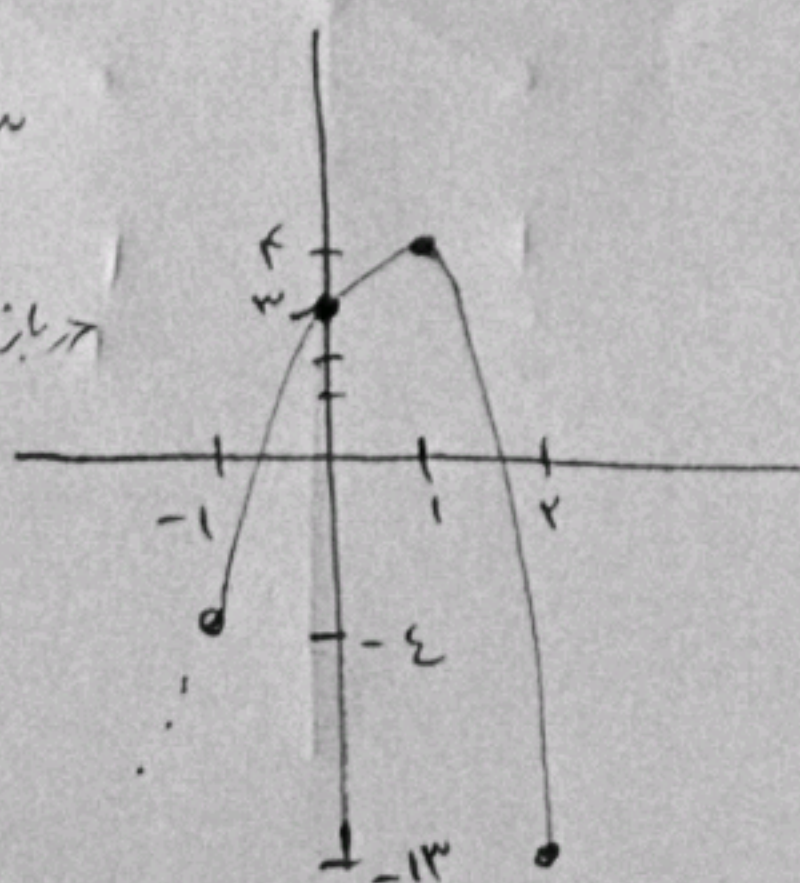
⑤

الف) $\lim_{x \rightarrow -3} [-3x] - [5x] \begin{cases} -3^+ & 11 - (-15) = 26 \\ -3^- & 9 - (-14) = 23 \end{cases}$

ب) $\lim_{x \rightarrow (-\frac{1}{14})^-} \left\lceil \frac{-1}{x^2} \right\rceil = \left\lceil \frac{-1}{(\frac{1}{14})^+} \right\rceil = \left\lceil \frac{-1}{\frac{1}{14^-}} \right\rceil = \lceil -14^- \rceil = -14$

⑥

$f(x) = 3x^2 - 3x + 3$



→

الف) $\lim_{x \rightarrow 1} [f(x)] \begin{cases} 1^+ & [6] = 6 \\ 1^- & [5] = 5 \end{cases}$

ب) $\lim_{x \rightarrow 0} [f(x)] \begin{cases} 0^+ & [3] = 3 \\ 0^- & [2] = 2 \end{cases}$

$$\text{ا) } \lim_{x \rightarrow r} \frac{(x-r)(x^r + rx + \epsilon)}{(x-r)(x+r)} < \begin{matrix} r^+ & \frac{x^r + rx + \epsilon}{x+r} = r \\ r^- & \frac{(x-r)(x^r + rx + \epsilon)}{x+r} = -r \end{matrix} \quad (7)$$

$$\text{ب) } \lim_{x \rightarrow r} \frac{|\cos x|}{\sin rx} < \begin{matrix} r^+ & \frac{-\sin x}{\sin rx} = \frac{-1}{r \cos x} = \frac{1}{r} \\ r^- & \frac{\sin x}{\sin rx} = \frac{1}{r \cos x} = -\frac{1}{r} \end{matrix}$$

$$\text{ا) } \lim_{x \rightarrow \frac{\pi}{r}} \sqrt{\cos x} \quad \text{Unit Circle} < \begin{matrix} \frac{\pi}{r}^+ & \sqrt{0^+} = 0 \\ \frac{\pi}{r}^- & \sqrt{0^-} \rightarrow 0 \text{ since } \cos \frac{\pi}{r} = 0 \end{matrix} \quad (8)$$

$$\text{ب) } \lim_{x \rightarrow 0} \sqrt{x - x\sqrt{x}} < \begin{matrix} 0^+ & \sqrt{0.1 - 0.1} = \sqrt{0} \Rightarrow 0 \text{ since } \sqrt{x} = 0 \\ 0^- & \sqrt{0.1 - 0.1} = \sqrt{0} \Rightarrow 0 \end{matrix} \quad (9)$$

$$\text{ا) } \lim_{x \rightarrow 0^+} \frac{(-1)^{\lfloor \sin x \rfloor}}{x^r(x-1)} \xrightarrow{\sin x} \frac{(-1)^0}{x^r(x-1)} = \frac{1}{x^r(x-1)} \xrightarrow{\frac{0}{-1-1+}} = -\infty$$

$$\text{ب) } \lim_{x \rightarrow r} \frac{x^r - \lfloor x^r \rfloor}{x - \lfloor x \rfloor} < \begin{matrix} r^+ & \frac{x^r - \epsilon}{x - r} = x + r = \epsilon \\ - & \\ r^- & \frac{x^r - r}{x - r} = 1 \end{matrix}$$

