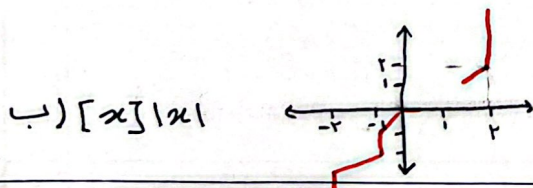
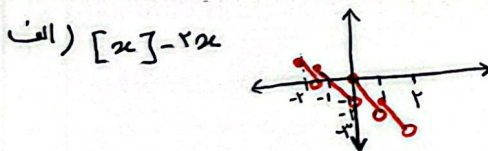
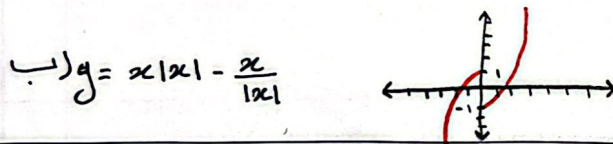
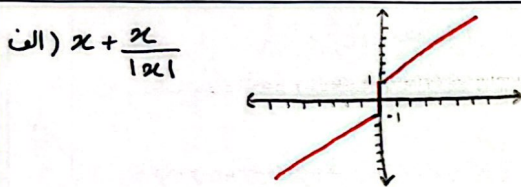


نام و نام خانوادگی آریخ پاسخنامه تشریحی تکلیف شماره ... لا کلاس A

الف) $x + |2x - 4| = |2x - 4| \rightarrow \begin{cases} 2x - 4 & x \geq 2 \\ -(2x - 4) = -2x + 4 & x < 2 \end{cases}$
 $\xrightarrow{\text{بند}} [2 + \infty)$

ب) $|x - 2| + |x - 1| - |x| \xrightarrow{\text{بند}} \begin{cases} \text{If } x < 0 \rightarrow 2 - x + 1 - x - (-x) = 3 - x \rightarrow (3 + \infty) \\ \text{If } 0 \leq x < 1 \rightarrow 2 - x + 1 - x - x = 3 - 3x \rightarrow [0, 3] \\ \text{If } 1 \leq x < 2 \rightarrow 2 - x + x - 1 - x = 1 - x \rightarrow (-1, 0] \\ \text{If } x \geq 2 \rightarrow x - 2 + x - 1 - x = x - 3 \rightarrow [-1, 2 + \infty) \end{cases}$
 $\xrightarrow{\text{بند}} [-1, 2 + \infty)$

$|3x - 3| - |x + 2| = k \rightarrow \begin{cases} 3x - 3 = 0 \rightarrow x = 1 \\ x + 2 = 0 \rightarrow x = -2 \end{cases}$
 $\begin{cases} \text{If } x < -2 \rightarrow -3x + 3 - (-x - 2) = -2x + 5 \rightarrow (9, +\infty) \\ \text{If } -2 \leq x < 1 \rightarrow -3x + 3 - x - 2 = -4x + 1 \rightarrow [-3, 9] \\ \text{If } x \geq 1 \rightarrow 3x - 3 - x - 2 = 2x - 5 \rightarrow [-3, +\infty) \end{cases}$
 $\xrightarrow{\text{بند}} k = 9 - 3$



الف) $\frac{3x}{y} - [3x] \rightarrow y - [y] \rightarrow 0 \leq y < 1 \rightarrow \text{بند: } [0, 1)$

ب) $4x - 4[x] \rightarrow 4(x - [x]) \rightarrow 0 \leq x - [x] < 1 \rightarrow 0 \leq y < 4 \rightarrow \text{بند: } [0, 4)$

ج) $x - \frac{x}{a} \xrightarrow{k} ak \leq x < a(k+1) \rightarrow f(x) = \frac{x}{a} - ak \rightarrow f(x) = (ak+r) - ak = r \rightarrow \text{بند: } [0, a)$
 $\xrightarrow{ak+r} 0 \leq r < a$

د) $[2x] - 2x \rightarrow 0 \leq y < 1 \rightarrow 0 \leq 2x < 1 \rightarrow -1 < f(x) \leq 0 \rightarrow \text{بند: } [-1, 0]$

الف) $4\sin^2 x + 4\cos^2 x \rightarrow y^2 = (4\sin^2 x + 4\cos^2 x)^2 = 16\sin^4 x + 32\sin^2 x \cos^2 x + 16\cos^4 x$

$\rightarrow y^2 = 4 + 8\sin^2 x + 16\sin^2 x \cos^2 x \rightarrow -1 \leq \sin^2 x, \cos^2 x \leq 1 \rightarrow [-\sqrt{13}, \sqrt{13}]$: بد

ب) $4\sin^2 x - 3\cos^2 x \rightarrow 4\sin^2 x + 3\cos^2 x = R \sin(x+\alpha) \rightarrow R = \sqrt{4^2 + 3^2} = 5$

$\tan \alpha = \frac{4}{3} \rightarrow f(x) = 5 \sin(x+\alpha) \rightarrow$ بد: $[-5, 5]$

ج) $[4\sin^2 x + 3\cos^2 x] \rightarrow R = \sqrt{16+9} \rightarrow g(x) \in [-5, 5] \rightarrow$ بد: $\{-5, -3, -1, 1, 3, 5\}$

د) $\sqrt{\cos^2 x - 2\sin^2 x} \rightarrow \cos^2 x - 2\sin^2 x \geq 0 \rightarrow \cos^2 x \geq 2\sin^2 x \rightarrow \frac{\cos^2 x}{\sin^2 x} \geq 2 \rightarrow \cot^2 x \geq 2$
 $\rightarrow 0 \leq f(x) \leq \sqrt{1} \rightarrow f(x) \in [0, 1] \rightarrow$ بد: $[0, \sqrt{1}]$

الف) $\sin^2 x + 3\sin^2 x + 2 \rightarrow -1 \leq y \leq 1 \rightarrow y^2 + 2y + 2 \rightarrow y_{\min} = -\frac{b}{2a} \rightarrow (-1, 5)$

ب) $\rightarrow (-1, 5)^2 + 3(-1, 5) + 2 = 2x^2 - 4x + 2 = -0.4x$

$y = -1 \rightarrow 1 - 3 + 2 = 0$ و $y = 1 \rightarrow 1 + 3 + 2 = 6 \rightarrow$ بد: $[0, 4]$

ب) $2\sin^2 x + 3\sin^2 x + 2 \rightarrow -1 \leq y \leq 1 \rightarrow 2y^2 + 3y + 2 \rightarrow y_{\min} = -\frac{b}{2a} = -0.75$

ب) $\rightarrow 0.75, y = -1 \rightarrow 1$ و $y = 1 \rightarrow 5 \rightarrow$ بد: $[0.75, 5]$

الف) $\sin^2 x + 4\cos^2 x \rightarrow (1 - \cos^2 x) + 4\cos^2 x = 1 + 3\cos^2 x \rightarrow 0 \leq \cos^2 x \leq 1$

$\cos^2 x = 0 \rightarrow 1 + 3 \cdot 0 = 1$ و $\cos^2 x = 1 \rightarrow 1 + 3 \cdot 1 = 4 \rightarrow$ بد: $[1, 4]$

ب) $\frac{2 \cot x}{1 + \cot^2 x} \rightarrow \frac{2 \frac{\cos}{\sin}}{1 + \frac{\cos^2}{\sin^2}} \rightarrow \frac{2 \cos}{\sin} = \frac{2(\cos)(\sin)}{\sin^2} \rightarrow 2 \cos \sin \rightarrow$ بد: $[-1, 1]$

الف) $\sin^2 x + \cos^2 x = y = -\frac{b}{2a} \rightarrow \frac{1}{2} \rightarrow$ بد: $[\frac{1}{2}, 1]$

ب) $[\sin^2 x + \cos^2 x] \rightarrow (\sin^2 x)^2 + (\cos^2 x)^2$
 $\rightarrow 1 - \sin^2 x \rightarrow \sin^2 x \in [0, 1]$

$f(y) = 2y^2 - 4y^2 + 4y^2 - 4y + 1 \rightarrow f(0) = 1$
 $f(1) = 1 \rightarrow$ بد: $[0, 1]$

الف) $\frac{2x^2 + 11x - 4}{x+4} \rightarrow \frac{2x^2 + 11x - 4}{x+4} = \frac{(2x^2 + 11x) - (x+4)}{x+4}$

$f(x) = \frac{2x(x+4) - (x+4)}{x+4} \rightarrow \frac{(2x-1)(x+4)}{x+4} \rightarrow f(x) = 2x-1 \rightarrow (-\infty, -9) \cup (-9, +\infty)$

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

ب) $\rightarrow 0.75, f(1) = 4 \rightarrow [0.75, \infty) - \{1\}$

