۱۹,۷۵

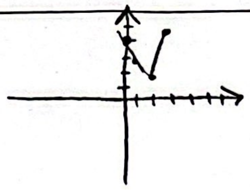
پاسخنامه تشریحی تکلیف شماره ...۷... کلاس .... شارنیا جعفری ......

۱ (۵)

الف) $y = x + |2x-4|$

$x - 2x + 4$ $-x+4$	$x + 2x - 4$ $3x - 4$

(2 at the break point between the columns, circled 2 under the first column)

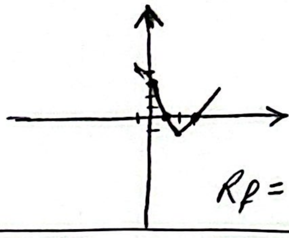


$R_f = [2, +\infty)$

ب) $y = |x+2| + |x-1| - |x|$

$-x+2-x+1+x$ $-x+3$	$-x+2-x+1-x$ $-3x+3$	$-x+2+x-1-x$ $-x+1$	$x-2+x-1-x$ $x-3$

(break points: 0, 1, 2; values at them: 3, 0, −1)



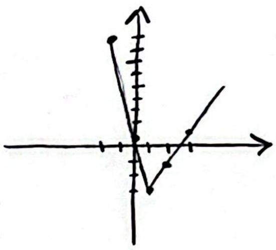
$R_f = [-1, +\infty)$

۲ (۵)

$|3x-3| - |x+2| = k$ یک ریشه

$-3x+3+x+2$ $-2x+1$	$-3x+3-x-2$ $-4x+1$	$3x-3-x-2$ $2x-1$

(break points: −2, 1; values at them: 9 (circled), −3 (circled))



برای اینکه یک ریشه داشته باشد

$K = -3$

۳ (۵)

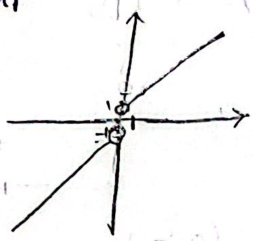
نمودار

الف) $y = x + \frac{x}{|x|}$

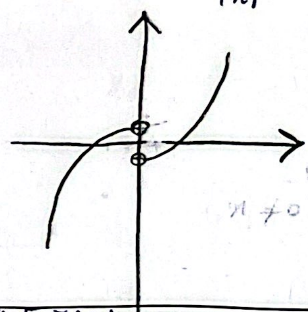
$x>0 \quad x+1$

$x<0 \quad x-1$

$0 \quad$ تعریف نشده



ب) $y = x|x| - \frac{x}{|x|}$



$x>0 \quad x^2-1$

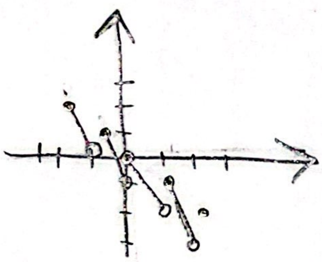
$x<0 \quad -x^2+1$

$0 \quad$ تعریف نشده

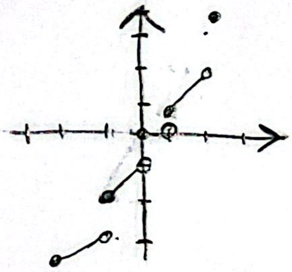
۴ (۵)

نمودار در بازه $[-2, 2]$

الف) $y = [x] - 2x$



ب) $y = [x]|x|$



۵ (۵)

برد

الف) $y = 3x - [3x]$

$0 \le 3x - [3x] < 1$

$[0, 1)$

ب) $y = 4x - 4[x]$

$y = 4(\underbrace{x - [x]}_{[0,1)}) \rightarrow [0, 4)$

ج) $x - 5[\frac{x}{5}]$

$5(\underbrace{\frac{x}{5} - [\frac{x}{5}]}_{[0,1)})$

$R_f = [0, 5)$

د) $y = [2x] - 2x$

$-1 < [2x] - 2x \le 0$

$(-1, 0]$

$-\sqrt{a^2+b^2} \le a\sin x + b\cos x \le \sqrt{a^2+b^2}$

الف) $y = 3\sin x + 4\cos x$

$-\sqrt{9+16} \le 3\sin x + 4\cos x \le \sqrt{9+16}$

$-\sqrt{25} \le 3\sin x + 4\cos x \le \sqrt{25}$

$[-\sqrt{25}, \sqrt{25}]$

2) $y = [3\sin x + 5\cos x]$

$-\sqrt{34} \le 3\sin x + 5\cos x \le \sqrt{34}$

$-6 \le [3\sin x + 5\cos x] \le 5$

$R_f = \{-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

ب) $y = 4\sin x - 3\cos x$

$-\sqrt{16+9} \le 4\sin x - 3\cos x \le \sqrt{16+9}$

$-\sqrt{25} \le 4\sin x - 3\cos x \le \sqrt{25}$

$[-5, 5]$

ج) $y = \sqrt{\cos x - 4\sin x}$

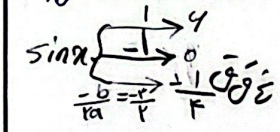
$-\sqrt{16+1} \le \cos x - 4\sin x \le \sqrt{16+1}$

$-\sqrt{17} \le \cos x - 4\sin x \le \sqrt{17}$

$[0, \sqrt{17}]$

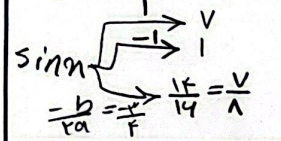
$\sqrt{\ } \rightarrow 0 \le \sqrt{\cos x - 4\sin x} \le \sqrt{17}$

الف) $y = \sin^2 x + 4\sin x + 3$



$R_f = [0, 8]$

ب) $y = 4\sin^2 x + 4\sin x + 3$



$R_f = [-\frac{1}{4}, 15]$

ج) $y = \sin^2 x + 4\cos^2 x$

$y = \sin^2 x + 4(1 - \sin^2 x) = \sin^2 x + 4 - 4\sin^2 x = -3\sin^2 x + 4$

$[0,1]$ $\quad [-3, 0]$

$R_f = [1, 4]$

د) $y = \frac{2\cot x}{1 + \cot^2 x}$

$\frac{2\frac{\cos x}{\sin x}}{\frac{1}{\sin^2 x}} = 2\cos x \sin x = \sin 2x$

$R_f = [-1, 1]$

الف) $y = \sin^4 x + \cos^4 x$

$2K = 4 \quad K = 2$

$2^{-2} \le \sin^4 x + \cos^4 x \le 1$

$\frac{1}{4} \le \sin^4 x + \cos^4 x \le 1$

$[\frac{1}{4}, 1]$

ب) $y = [\sin^8 x + \cos^8 x]$

$2K = 8 \quad K = 4$

$2^{-3} \le \sin^8 x + \cos^8 x \le 1$

$\frac{1}{8} \le \sin^8 x + \cos^8 x \le 1$

$\sqrt{\ } \rightarrow 0 \le \quad \le 1$

$[0, 1]$ $\quad \{0, 1\}$

الف) $y = \frac{2x^2 + 6x - 4}{x + 4}$

$2x^2 + 6x - 4 \mid x + 4$

$2x^2 + 8x \mid 2x - 1$

$-x - 4$

$+x + 4$

0

$y = \frac{(2x-1)(x+4)}{(x+4)} = 2x - 1$

$\forall x \neq -4$

$R_f = \mathbb{R} - \{-9\}$ $\quad y \neq -9$

ب) $y = \frac{x^3 - 1}{x - 1} = \frac{(x-1)(x^2+x+1)}{(x-1)} = x^2 + x + 1$

$\forall x = 1$

$y \neq 3$

$-\frac{b}{2a} = \frac{-1}{2}$

$R_f = [\frac{3}{4}, +\infty)$

$\frac{1}{4} - \frac{2}{4} + \frac{4}{4} = \frac{3}{4} \rightarrow y_{min}$