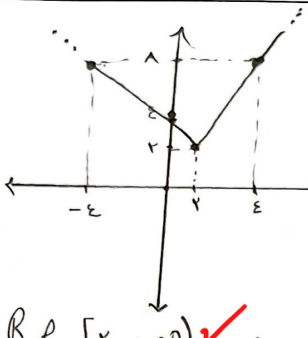
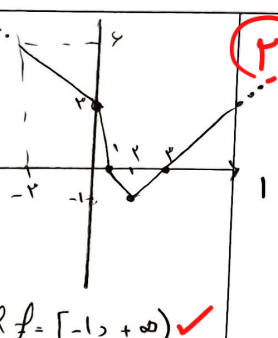
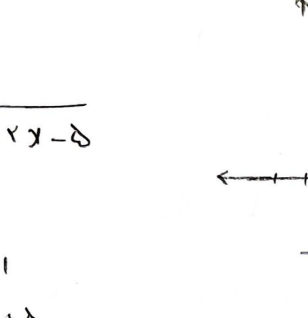
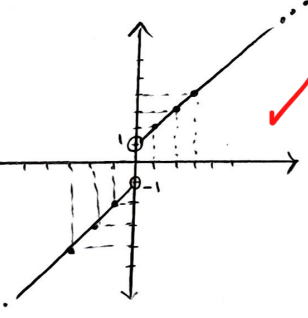
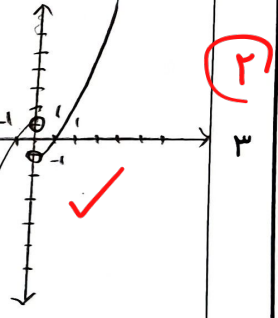
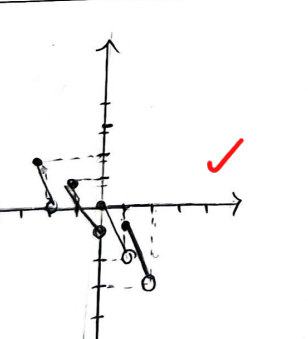
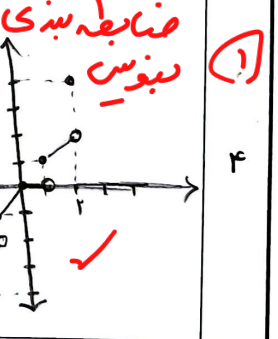
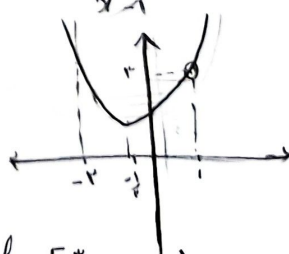


الف) $y = x + 2x - 4$ $\frac{0}{x+4-2x} \quad \frac{x+2x-4}{3x-4}$ if $\begin{cases} x \geq 2 \rightarrow 3x-4 \\ x < 2 \rightarrow -x+4 \end{cases}$	 $R_f = [2, +\infty)$ ✓	ب) $y = x-2 + x-1 - x$ $\frac{0}{-x+3} \quad \frac{-x+2}{-x+1} \quad \frac{x-3}{x-3}$ if $\begin{cases} x \geq 2 \rightarrow x-3 \\ 1 \leq x < 2 \rightarrow -x+1 \\ 0 \leq x < 1 \rightarrow -x+3 \\ x < 0 \rightarrow -x+3 \end{cases}$	 $R_f = [-1, +\infty)$ ✓	۲
$y = 3x-3 - x+2 = k$ $\frac{-2}{-2x+5} \quad \frac{1}{-4x+1} \quad \frac{2x-5}{2x-5}$ if $\begin{cases} x \geq 1; 2x-5 \\ -2 \leq x < 1 \rightarrow -4x+1 \\ x < -2 \rightarrow -2x+5 \end{cases}$	 $k = -3$ ✓	کدام مقدار k را می توان داشت؟	۲	۲
الف) $y = x + \frac{x}{ x }$ $\frac{0}{x-1} \quad \frac{x}{x+1}$ if $\begin{cases} x+1 \rightarrow x \geq 0 \\ x-1 \rightarrow x < 0 \end{cases}$		ب) $y = x x - \frac{x}{ x }$ $\frac{0}{-x^2+1} \quad \frac{x^2-1}{x^2-1}$ if $\begin{cases} x \geq 0 \rightarrow x^2-1 \\ x < 0 \rightarrow -x^2+1 \end{cases}$		۳
الف) $y = [x] - 2x$		ب) $y = [x]$ یا $[x]$ ضابطه بندی هاروینی $\frac{0}{-[x]x} \quad \frac{[x]x}{[x]x}$		۴
الف) $y = 3x - [3x]$ $0 \leq \Omega - [\Omega] < 1$ $R_f = [0, 1)$ ✓	ب) $4x - 4[x]$ $4(x - [x]) \Rightarrow$ $R_f = [0, 4)$ ✓	ج) $y = x - 5[\frac{x}{5}]$ $5(\frac{x}{5} - [\frac{x}{5}]) \Rightarrow$ $R_f = [0, 5)$ ✓	د) $y = [2x] - 2x$ $(0 \leq 2x - [2x] < 1) \times -1$ $0 \geq [2x] - 2x > -1$ $R_f = (-1, 0]$ ✓	۵

$1) y = 3 \sin x + 4 \cos x$ $-\sqrt{9+16} \leq \frac{3 \sin x + 4 \cos x}{5} \leq \sqrt{9+16}$ $Rf = [-\sqrt{13}, \sqrt{13}] \checkmark$	$2) y = 5 \sin x - 3 \cos x$ $-\sqrt{25+9} \leq 5 \sin x - 3 \cos x \leq \sqrt{25+9}$ $Rf = [-8, +8] \checkmark$	$3) y = [4 \sin x + 8 \cos x]$ $-\sqrt{16+64} \leq 4 \sin x + 8 \cos x \leq \sqrt{16+64}$ $Rf' = [-\sqrt{68}, \sqrt{68}]$ $Rf = [-4\sqrt{17}, 4\sqrt{17}] \checkmark$	$4) y = \sqrt{\cos x - 2 \sin x}$ $-\sqrt{1+4} \leq \cos x - 2 \sin x \leq \sqrt{1+4}$ $Rf' = [-\sqrt{5}, \sqrt{5}]$ $Rf = [0, \sqrt{5}] \checkmark$	(2)
$1) y = \sin^2 x + 3 \sin x + 2$ $\sin = 1 \rightarrow y \rightarrow \max$ $\sin = -1 \rightarrow 0 \rightarrow \min$ $\sin = \frac{b}{ra} = \frac{-3}{2} \rightarrow \text{جدا}$ $Rf = [0, 4] \checkmark$	$2) y = 2 \sin^2 x + 3 \sin x + 2$ $\sin = 1 \rightarrow y \rightarrow \max$ $\sin = -1 \rightarrow 1$ $\sin = \frac{-b}{ra} = \frac{-3}{2} \rightarrow \frac{y}{\lambda} \rightarrow \min$ $Rf = [\frac{y}{\lambda}, y] \checkmark$		y	(2)
$1) y = \sin^2 x + 2 \cos^2 x$ $\frac{\sin^2 x + \cos^2 x + \cos^2 x}{1} \Rightarrow Rf = [1, 2] \checkmark$	$2) y = \frac{2 \cot x}{1 + \cot^2 x} = \frac{2 \cos x}{\frac{\sin x}{\cos x}} = \frac{2 \cos x \cdot \sin x}{\sin^2 x + \cos^2 x}$ $Rf = [-1, 1] \checkmark$		1	(2)
$1) y = \sin^4 x + \cos^4 x$ $\frac{1-2}{2} \leq \sin^4 x + \cos^4 x \leq \frac{1+2}{2}$ $Rf = [\frac{1}{2}, 1] \checkmark$	$2) y = [\sin^4 x + \cos^4 x]$ $\frac{1-2}{2} \leq \sin^4 x + \cos^4 x \leq \frac{1+2}{2}$ $Rf = [\frac{1}{2}, 1] \rightarrow Rf = \{0, 1\} \checkmark$		9	(2)
$1) y = \frac{2x^2 + 7x - 6}{x + 2} = \frac{(2x-1)(x+6)}{x+2}$ $y = 2x - 1 \Rightarrow Rf = R - \{-9\} \checkmark$ $-6 \rightarrow \text{ردا صحت}$	$2) y = \frac{x^2 - 1}{x - 1} = \frac{(x-1)(x+1)}{x-1}$ $y = x + 1 \rightarrow$ $(1, 2) \rightarrow$ $1 \text{ و } 2 \text{ و } 3$ $Rf = [\frac{3}{2}, +\infty) \checkmark$		10	(2)