۱۹٫۷۵

B نازنین سبز (?) — بردهام منصوری (?)

(۲)

$y=x^3-3x^2+3x \quad R_f=R$

$y=(x-1)^3+1 \rightarrow y-1=(x-1)^3 \rightarrow \sqrt[3]{y-1}+1=x$

$R_f=R$ ✓

$y=\dfrac{1}{x^2-2x}$

$yx^2-2yx-1=0$

$\Delta\geq 0 \rightarrow 4y^2+4y\geq 0 \quad 4y(y+1)\geq 0$

+ | −1 | − | 0 | +

✓ $R_f=(-\infty \quad -1]\cup[0 \quad +\infty)$

۲- (۲)

$y=x^2-4x+10 \qquad \frac{+4}{2}=2 \qquad y_{min}=6 \qquad [6 \quad +\infty)$ ✓

$y=-x^2+6x+3 \qquad \frac{-6}{-2}=3 \qquad y_{min}=12 \qquad (-\infty \quad 12]$ ✓

$y=\sqrt{x^2-4x-3} \qquad \frac{4}{2}=2 \quad -7 \qquad [0 \quad +\infty)$ ✓

$y=\sqrt{6x-x^2} \qquad \frac{-6}{-2}=3 \quad 9 \qquad [0 \quad 3]$ ✓

۳- (۲)

$y=x^3-5x^2+3x+1 \quad R$ ✓ $\qquad y=\sqrt{x^4-6x^3+5x+1} \quad [0 \quad +\infty)$ ✓

$y=x^7-6x^4+4x+2 \quad R$ ✓ $\qquad y=(x^5-4x^3+3x+1)^2 \quad [0 \quad +\infty)$ ✓

۴. (۲)

$y=\dfrac{4x+1}{x-4} \quad R-\{4\}$ ✓

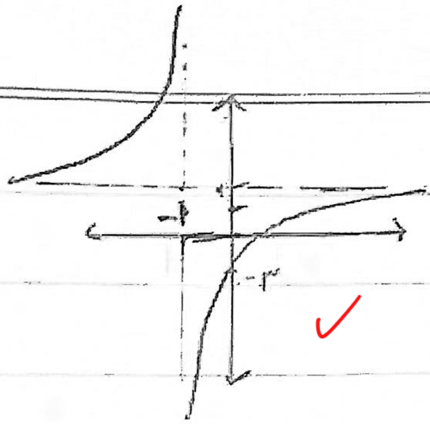
$y=\dfrac{2x+1}{x+1} \quad R-\{2\}$ ✓

۵- (۲)

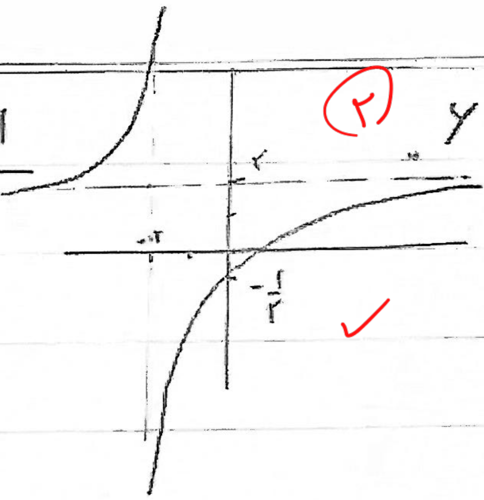
$y=\sqrt{\dfrac{2x+4}{x+1}} \quad [0 \quad +\infty)-\{\sqrt{2}\}$ ✓

$y=\sqrt{\dfrac{3x+1}{2-x}} \quad [0 \quad +\infty)$ ✓

$y = \dfrac{2x-3}{x+1}$



$y = \dfrac{2x-1}{x+2}$



(۲) ✓ ✓

۷ -

(۲)

$y = \sin x + \dfrac{1}{\sin x}$ $\quad (-\infty \quad -2] \cup [2 \quad +\infty)$ ✓

$y = \dfrac{x^4+1}{x^2} = x^2 + \dfrac{1}{x^2}$ $\quad (-\infty \quad -2] \cup [2 \quad +\infty)$ ✓

$y = \dfrac{\sqrt[3]{x^2}+1}{\sqrt[3]{x^5}}$ $\quad \sqrt[3]{x} + \dfrac{1}{\sqrt[3]{x}} = \quad (-\infty \quad -2] \cup [2 \quad +\infty)$ ✓

$y = \sqrt{x} + \dfrac{1}{\sqrt{x}}$ $\quad [2 \quad +\infty)$ ✓

۸ - (۱٫۷۵)

$y = x^2 + \dfrac{1}{x^2+2} \Rightarrow y = x^2+2 + \dfrac{1}{x^2+2} - 2$

$a + \dfrac{1}{a} \geq 2$ $\quad x=0$ تشریحی $\quad a = 2 \to y = 2 + \dfrac{1}{2}$

$R_f = [\dfrac{1}{2}, +\infty)$

$\dfrac{x^2+5}{\sqrt{x^2+4}} \Rightarrow \dfrac{x^2+4+1}{\sqrt{x^2+4}} \quad \sqrt{x^2+4} + \dfrac{1}{\sqrt{x^2+4}} \quad [\dfrac{5}{2} \quad +\infty)$ ✓

۹ - (۲)

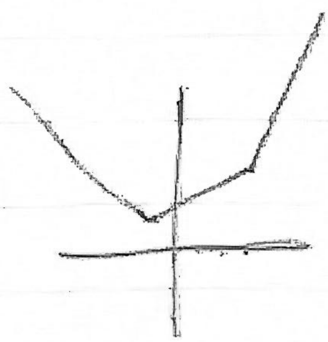
$y = |x-3| + |3x+3|$

$-1 \qquad 3$

$3-x-3x-3 \qquad 3-x+3x+3 \qquad x-3+3x+3$

$-4x \qquad 2x+6 \qquad 4x$

✓



۱۰ (۲)

$y = |x-2| + |2x+2|$

$x \geq 2$	$x \geq -1$	$x \geq 1$
$2 > x > -1$	$-1 > x > -2$	$1 > x > -1$
$x \leq -2$	$x \leq -2$	$x \leq -1$
$y = x-2+2x+2$	$y = -x+2-2x-2$	$y = -x+2+2x+2$
$y = 3x$	$y = -3x$	$y = x+4$

$Rf = [0, +\infty)$ ✓

$y = |2x-2| - |x+1|$

$x \geq 2$	$x \geq -1$	$x \geq 1$
$2 > x > -1$	$-1 > x > -2$	$1 > x > -1$
$x \leq -2$	$x \leq -2$	$x \leq -1$
$y = 2x-2-x-1$	$y = -2x+2-x-1$	$y = 2-2x-x-1$
$y = x-3$	$y = -3x+1$	$y = -3x+1$
$y = -x-3$	$y = -x-3$	$y = -x-3$

$Rf = [-3, +\infty)$ ✓