شهرزاد شوشتری کلاس ۹

۱۱

الف) $y = x^3 - 3x^2 + 3x \rightarrow y = (x-1)^3 + 1 \rightarrow (x-1)^3 = y-1 \rightarrow x-1 = \sqrt[3]{y-1} \rightarrow x = \sqrt[3]{y-1} + 1$

$R_y = R$

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

$\frac{-1}{+} \quad \frac{0}{-} \quad \frac{}{+}$ $\quad R_y = (-\infty, -1] \cup [0, +\infty)$

۱۲

$y = x^2 - 4x + 10 \rightarrow \frac{-b}{2a} \rightarrow \frac{4}{2} = 2 \rightarrow 4 - 8 + 10 \rightarrow 6 \rightarrow R_y = [6, +\infty)$

ب) $-x^2 + 4x + 32 \rightarrow \frac{-b}{2a} \; ; \; \frac{-4}{-2} = 2 \rightarrow -4 + 8 + 32 \Rightarrow 36 \rightarrow R_y = (-\infty, 36]$

ج) $= \sqrt{x^2 - 4x - 32} \rightarrow \frac{-b}{2a} = \frac{4}{2} = 2 \rightarrow \sqrt{4 - 8 - 32} \rightarrow R_y = [0, +\infty)$

د) $= \sqrt{4x - x^2} \rightarrow \frac{-b}{2a} = \frac{-4}{-2} = 2 = \sqrt{36 - 9} = \sqrt{9} = R_y = [0, 2]$

۱۳

الف) $R_y = R \quad -4x^3 - 3x^2 + 12x + 1$

ب) $R_y = R \quad -4y \cdot x^3 - 4x^2 + 12x + 2$

ج) $R_y = [0, +\infty) \rightarrow y = \sqrt{x^6 - 4x^4 + 5x + 1}$

د) $R_y = [0, +\infty) \rightarrow y = (x^5 - 12x^4 + 12x + 12)^2$

۱۴

الف) $y = \frac{2x+1}{x-2} \rightarrow R_y = R - \{2\}$

ب) $y = \frac{2x+1}{x+1} \rightarrow R_y = R - \{2\}$

۱۵

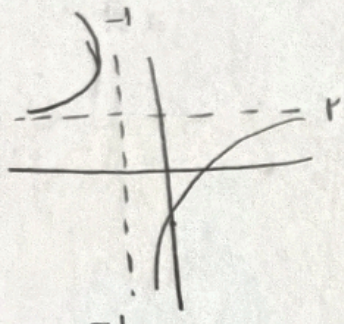
الف) $y = \sqrt{\frac{2x+4}{x+1}} \rightarrow R_y = [0, +\infty) - \{\sqrt{2}\}$

ب) $y = \sqrt{\frac{2x+1}{2-x}} \rightarrow \sqrt{\frac{2x+1}{-x+2}} \rightarrow \sqrt{-2} \; \text{ریشه ندارد} \rightarrow R_y = [0, +\infty)$

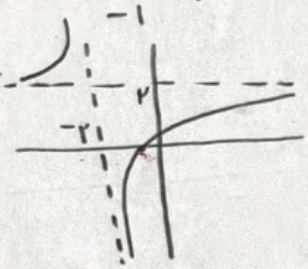
شهرزاد شوشتری

۶)

الف) $y = \frac{2x-3}{x+1}$



ب) $y = \frac{2x-1}{x+2}$



۷)

الف) $y = \sin x + \frac{1}{\sin x}$ $R_y : (-\infty, -2] \cup [2, +\infty)$

ب) $y = \frac{x^4+1}{x^3} = x + \frac{1}{x^3}$ $R_y : (-\infty, -2] \cup [2, +\infty)$

ج) $y = \frac{\sqrt[3]{x^2+1}}{\sqrt[5]{x}} \rightarrow \sqrt[15]{x} + \frac{1}{\sqrt[5]{x}}$ $R_y : (-\infty, -2] \cup [2, +\infty)$

$y = \sqrt{x} + \frac{1}{\sqrt{x}}$ $R_y = [2, +\infty)$

۸)

$y = x^2 + 2 + \frac{1}{x^2+2} \xrightarrow{x^2 \geq 0} R_y = [\frac{1}{2}, +\infty)$

$y = \frac{x^2+3+1}{\sqrt{x^2+3}} \rightarrow \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} \xrightarrow{x=0} \sqrt{3} + \frac{1}{\sqrt{3}} = \frac{4}{\sqrt{3}} \rightarrow R_y = [\frac{4}{\sqrt{3}}, +\infty)$

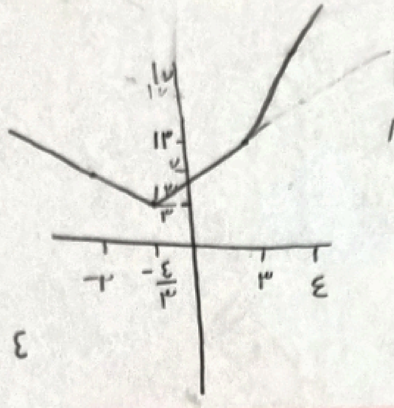
شهرزاد شوشتری

۹)

$y = |x-3| + |3x+4|$

$-\frac{4}{3}$ ، 3

$x < -\frac{4}{3}$	$-\frac{4}{3} \le x < 3$	$x \ge 3$
$-x+3-3x-4$	$-x+3+3x+4$	$x-3+3x+4$
$-4x-1$	$2x+7$	$4x+1$



$R_y = [3, +\infty)$

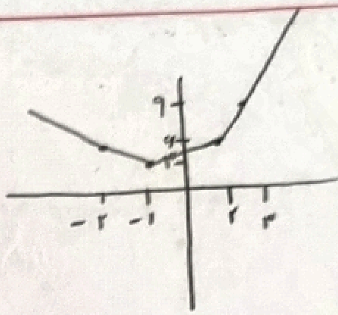
۱۰)

الف) $y = |x-2| + |2x+2|$

$R_y = [3, +\infty)$

$x < -1$	$-1 \le x < 2$	$x \ge 2$
$-x+2-2x-2$	$-x+2+2x+2$	$x-2+2x+2$
$-3x$	$x+4$	$3x$

x	-2	-1	2	3
y	6	3	6	9



ب) $y = |2x-2| - |x+1|$

$R_y = [-2, +\infty)$

$x < -1$	$-1 \le x < 2$	$x \ge 2$
$-2x+2+x+1$	$-2x+2-x-1$	$2x-2-x-1$
$-x+3$	$-3x+1$	$x-3$

x	-2	-1	1	2	3
y	5	4	-2	-1	0