

11, 20

نام و نام خانوادگی هوشیار پاسخنامه تشریحی تکلیف شماره 9 کلاس A

الف) $y = x^3 - 3x^2 + 3x - 1 + 1 \rightarrow y = (x-1)^3 + 1 \sim R_y = \mathbb{R}$

$R = (-\infty, 1] \cup (1, +\infty)$
 $R_y = R - (-1, 1]$

1, 10

ب) $y = \frac{1}{x^2 - 2x} \rightarrow yx^2 - 2yx + 1 = 0 \rightarrow \Delta = 4y^2 - 4y(-1) = 4y^2 + 4y$
 $\sim \Delta \geq 0 \rightarrow \frac{y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow y \neq 0 \sim 4y^2 + 4y \geq 0 \rightarrow 4y(y+1) \geq 0 \rightarrow y \neq -1$

-1, 1

الف) $y = x^2 - 4x + 1 \rightarrow x_5 = \frac{-(-4)}{2} = 2 \rightarrow y_5 = 4 - 8 + 1 = -3$

1, 10

$\sim R_y = [-3, +\infty)$

ب) $y = x^2 + 4x + 3 \rightarrow x_5 = -2 \rightarrow y_5 = 4 - 8 + 3 = -1$

ج) $y = \sqrt{x^2 - 4x + 3} \rightarrow \Delta = 16 - 4(1)(-3) = 28 \sim \frac{-\Delta}{2a} = \frac{-28}{2} = -14 \rightarrow y_5 = [-14, +\infty)$

د) $y = \sqrt{4x - x^2} \rightarrow x_{max} = \frac{4}{2} = 2 \rightarrow y_{max} = 2 \sim R_y = [-\infty, 2]$

الف) $R_y = \mathbb{R}$

ب) $R_y = \mathbb{R}$

ج) $R_y = [-1, +\infty)$

د) $[2, +\infty)$

1, 10

الف) $y = \frac{3x+1}{x-2} \rightarrow \mathbb{R} - \{3\} = R_y$

5

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

الف) $y = \sqrt{\frac{4x+8}{x+1}} \rightarrow y^2x + y^2 = 4x + 8 \rightarrow y^2x - 4x = y^2 + 8 \rightarrow x(y^2 - 4) = y^2 + 8$

$\sim x = \frac{y^2 + 8}{y^2 - 4} \rightarrow y \neq 2, -2 \rightarrow \frac{-8}{+1} \rightarrow \frac{+8}{-1} \rightarrow R_y = \mathbb{R} - [-2, 2]$

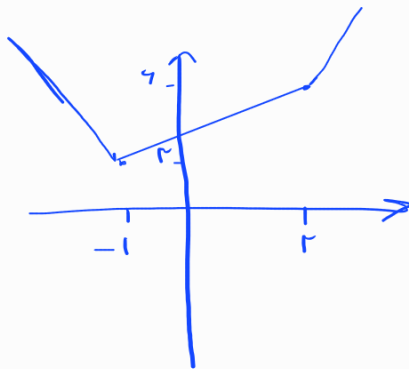
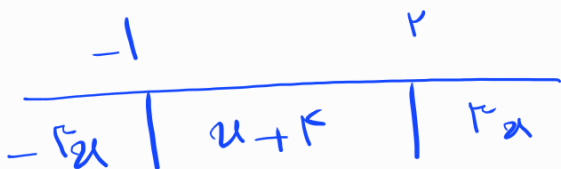
$\rightarrow R = [-2, 2]$

ب) $y = \sqrt{\frac{4x+1}{x-2}} \rightarrow 4y^2 - y^2x = 4x + 1 \rightarrow 4y^2 - 1 = 4x + y^2x$

$4y^2 - 1 = x(4 + y^2) \rightarrow x = \frac{4y^2 - 1}{4 + y^2} \rightarrow \frac{-1}{+1} \rightarrow \frac{4}{+1} \rightarrow R_y = \mathbb{R} - [-1, 4]$

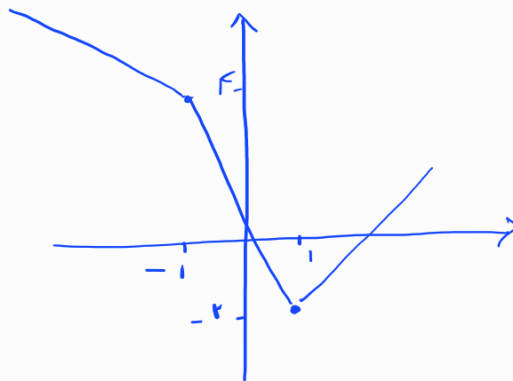
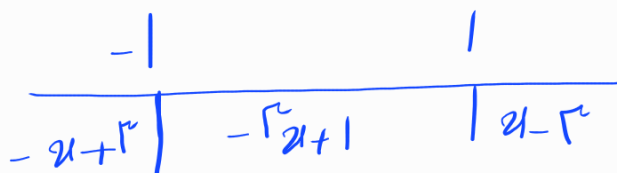
$R = [-1, 4]$

الف.



$$R = [1, +\infty)$$

ب.



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