

1) $y = x^2 - 2 \Rightarrow x^2 \leq y + 2 \Rightarrow x = \sqrt{y+2} \Rightarrow R_f = [-\infty, +\infty)$ (1)

2) $y = x^2 + 1 \Rightarrow x^2 \leq y - 1 \Rightarrow x = \sqrt{y-1} \Rightarrow R_f = R$ (2)

3) $y = x^2 - 2x + 1 \Rightarrow x^2 - 2x + 1 = y \Rightarrow x^2 - 2x + 1 - y = 0 \Rightarrow x = 1 \pm \sqrt{y}$
 $\Rightarrow x \leq 1 + \sqrt{y} \Rightarrow R_f = [1, +\infty)$ (3)

4) $x = \frac{y}{x} \pm \sqrt{y + \frac{y}{x}} \rightarrow R_f = [-\frac{y}{x}, +\infty)$

5) $y = x^2 - 2x + 1 \Rightarrow x^2 - 2x + 1 = y \Rightarrow x^2 - 2x + 1 - y = 0 \Rightarrow x = 1 \pm \sqrt{y}$

6) $y = x^2 - 2x + 1 + \frac{y}{x} - \frac{y}{x} \rightarrow y = (x - \frac{y}{x})^2 - \frac{y}{x} \rightarrow (x - \frac{y}{x})^2 = y + \frac{y}{x}$

7) $x^2 y - 2y = x^2 + 1 \Rightarrow x^2 y - x^2 = y + 1 \Rightarrow x^2 (y - 1) = y + 1$

8) $x^2 = \frac{y+1}{y-1} \Rightarrow x = \sqrt{\frac{y+1}{y-1}} \Rightarrow R_f = (-\infty, -\frac{1}{\sqrt{y}}] \cup (1, +\infty)$

9) $y|x| - 1 = y \Rightarrow |x| = \frac{y+1}{y-1} \Rightarrow |x| = \frac{y+1}{y-1} \Rightarrow x = \pm \frac{y+1}{y-1}$

10) $R_f = (-\infty, \frac{1}{\sqrt{y}}] \cup (1, +\infty)$ (4)

11) $R_f = (-\infty, -\frac{1}{\sqrt{y}}] \cup (1, +\infty)$ (5)

12) $x^2 y - 2x y = |x| y (x - 1) \Rightarrow x = \frac{y \pm \sqrt{(y)^2 + y(y-1)}}{y} \Rightarrow x = \frac{y \pm \sqrt{y^2 + y^2 - y}}{y} \Rightarrow x = \frac{y \pm \sqrt{2y^2 - y}}{y}$

13) $\rightarrow y x^2 - 2x y - 1 = 0 \rightarrow x = \frac{2y \pm \sqrt{(2y)^2 + 4(y+1)}}{2y} \Rightarrow x = \frac{2y \pm \sqrt{4y^2 + 4y + 4}}{2y} \Rightarrow x = \frac{2y \pm 2\sqrt{y^2 + y + 1}}{2y} \Rightarrow x = \frac{y \pm \sqrt{y^2 + y + 1}}{y}$

14) $y = x^2 - 2x + 1 \Rightarrow x^2 - 2x + 1 = y \Rightarrow x^2 - 2x + 1 - y = 0 \Rightarrow x = 1 \pm \sqrt{y}$
 $\Rightarrow x \leq 1 + \sqrt{y} \Rightarrow R_f = [-1, +\infty)$ (6)

15) $y = x^2 - 2x + 1 \Rightarrow x^2 - 2x + 1 = y \Rightarrow x^2 - 2x + 1 - y = 0 \Rightarrow x = 1 \pm \sqrt{y}$
 $\Rightarrow x \leq 1 + \sqrt{y} \Rightarrow R_f = (-\infty, 1] \cup (1, +\infty)$ (7)

16) $y = x^2 - 2x + 1 \Rightarrow x^2 - 2x + 1 = y \Rightarrow x^2 - 2x + 1 - y = 0 \Rightarrow x = 1 \pm \sqrt{y}$
 $\Rightarrow x \leq 1 + \sqrt{y} \Rightarrow R_f = (-\infty, 1] \cup (1, +\infty)$ (8)

2) $y = \sqrt{x^2 - 2x + 2}$ Min $\begin{matrix} y \\ -V \end{matrix}$ $R_f = \sqrt{[-V, +\infty)} \cup [0, +\infty)$ (4)

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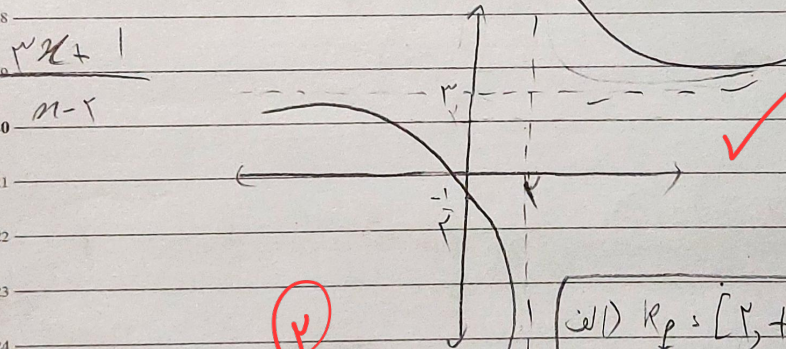
3) $y = \sqrt{-x^2 + 6x + 10}$ Max $\begin{matrix} y \\ 14 \end{matrix}$ $R_f = \sqrt{[-\infty, +14]} = [0, 14]$

4) $R_f = \mathbb{R}$ ✓

5) $R_f = [0, +\infty)$ ✓

6) $R_f = \mathbb{R} - \{x\}$ ✓

7) $R_f = \sqrt{\mathbb{R} - \{x\}} \cup [0, +\infty) - \{x\}$ ✓



8) $R_f = [2, +\infty)$ ✓

9) $y = \frac{x^2 - 2}{x + 1} = \frac{x(x-2)}{x+1}$ $R_f = \sqrt{[-\infty, -1] \cup [2, +\infty)}$

10) $R_f = (-\infty, \sqrt{-1}] \cup [\sqrt{2}, +\infty)$