

$$y = x^2 - 5 \Rightarrow x^2 = y + 5 \Rightarrow x = \sqrt{y + 5} \Rightarrow y + 5 \geq 0 \Rightarrow y \geq -5 \Rightarrow R_f = [-5, \infty)$$

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

$$\text{الف) } x^2 - 4x + 6 \Rightarrow (x - 2)^2 + 2 = y \Rightarrow x = \sqrt{y - 2} + 2 \Rightarrow R_f = [2, \infty)$$

$$\text{ب) } y = x^2 - 5x + 1 \Rightarrow \left(\frac{y}{x} - \frac{5}{x}\right)^2 - \frac{25}{x^2} \Rightarrow x = \sqrt{y + \frac{25}{x^2}} + \frac{5}{x} \Rightarrow R_f = \left[-\frac{25}{4}, \infty\right)$$

$$\text{الف) } y = \frac{x^2 + 3}{x^2 - 2} \Rightarrow yx^2 - 2y = x^2 + 3 \Rightarrow yx^2 - x^2 = 2y + 3 \Rightarrow x^2(y - 1) = 2y + 3$$

$$x^2 = \frac{2y + 3}{y - 1} \Rightarrow x = \sqrt{\frac{2y + 3}{y - 1}}$$

$$R_f = (-\infty, -\frac{3}{2}] \cup (1, \infty)$$

$$\text{ب) } y = \frac{2|x| + 1}{|x| - 2} \Rightarrow y(|x| - 2) = 2|x| + 1 \Rightarrow y|x| - 2y = 2|x| + 1 \Rightarrow y|x| - 2|x| = 2y + 1 \Rightarrow |x|(y - 2) = 2y + 1$$

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

$$\text{الف) } x^2 - 6x + 2 \Rightarrow R_f = [-7, \infty)$$

$$\frac{-b}{2a} = 3 \quad 9 - 18 + 2 = -7 = y_{\min}$$

جواب سوال ۵ در تست ۴ یادداشت شد

$$\text{ب) } -x^2 + 4x + 2 \Rightarrow R_f = (-\infty, 7]$$

$$\frac{-b}{2a} = \frac{4}{-2} = -2 \quad y_{\max} = -(-2)^2 + 4(-2) + 2 = 7$$

$$\text{الف) } \sqrt{x^2 - 6x + 2} \quad \sqrt{[-7, \infty)} \Rightarrow R_f = [0, \infty)$$

$$\frac{-b}{2a} = \frac{6}{2} = 3 \quad y_{\min} = 9 - 18 + 2 = -7$$

جواب سوال ۶ در تست ۵ یادداشت شد

$$\text{ب) } \sqrt{-x^2 + 4x + 10} \Rightarrow \sqrt{[-2, 6]} \Rightarrow R_f = [0, \sqrt{14}]$$

$$-b = 4 \quad y_{\max} = -(-2)^2 + 4(-2) + 10 = 6$$

$y = \frac{1}{x^r - rx} \Rightarrow x^r y - rx y = 1 \Rightarrow x^r - rx y - 1$ (1) ((ف سوال - جواب))
 $\Delta = 14y^r - ry > 0 \Rightarrow ry(ry-1) > 0 \Rightarrow \frac{1}{r} < y < \frac{1}{r} \Rightarrow R_f = (-\infty, \frac{1}{r}] \cup [\frac{1}{r}, \infty)$
 $x = \frac{ry \pm \sqrt{14y^r + ry}}{ry} \xrightarrow[y \neq 0]{\Delta > 0} ry^r + ry > 0 \rightarrow \frac{-1/r}{+1/r} \rightarrow R_f = (-\infty, -1/r] \cup (1/r, \infty)$

الف) $x^2 + rx^r + rx + 1 \quad R_f = R$ ✓

ب) $\sqrt{x^2 + rx^r + rx + 1} = R_f = [0, \infty)$ (2)

الف) $y = \frac{rx+1}{x+r} \quad R - \{\frac{a}{c}\} = R_f = R - \{r\}$ ✓ (1)

ب) $y = \sqrt{\frac{rx+1}{x+r}} \rightarrow R_f = R - \{r\} \xrightarrow{\text{انقلاب}} R_f = [0, +\infty) - \{r\}$

ب) $y = \frac{rx-r}{1-rx} \Rightarrow R_f = R - \{-1\}$

الف) $y = \frac{rx+1}{x-r}$

محاذ = 2 محاذ افقی = $\frac{a}{c} = r$

ب) $y = \frac{rx-r}{1-rx} \Rightarrow y = -r \quad x \neq \frac{1}{r}$
 محاذ عمودی = $\frac{1}{r}$ محاذ = $-r$

الف) $y = \frac{\cos^r x}{\cos^r x} + \frac{1}{\cos^r x} \Rightarrow R_f = [1, \infty)$ ✓ (2)

ب) $\sqrt{\frac{x^r+1}{x}} \Rightarrow \sqrt{x + \frac{1}{x}} \Rightarrow \sqrt{(-\infty, -1] \cup [1, \infty)}$
 $R_f = (-\infty, -\sqrt{r}] \cup [\sqrt{r}, \infty)$ ✓