

P

Date :

$$1 \text{ الف) } y = x^2 - 5 \rightarrow x^2 = y + 5 \rightarrow x = \sqrt{y+5} \quad (1) \quad (2)$$

$$2 \rightarrow y + 5 \geq 0 \rightarrow y \geq -5 \rightarrow R_f = [-5, +\infty)$$

$$3 \text{ ب) } y = x^2 + 1 \rightarrow y - 1 = x^2 \rightarrow \sqrt{y-1} = x \rightarrow R_f = \mathbb{R}$$

$$5 \text{ الف) } y = x^2 - 2x + 2 \rightarrow y = x^2 - 2x + 1 + 1 \rightarrow y = (x-1)^2 + 1 \quad (2)$$

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

$$7 \rightarrow y \geq 1 \Rightarrow R_f = [1, +\infty)$$

$$9 \text{ ب) } y = x^2 - 2x + 1 - y = 0 \quad (2)$$

$$10 \frac{2 \pm \sqrt{4 - 4(1-y)}}{2} \rightarrow 2 \pm \sqrt{4 - 4(1-y)} \geq 0$$

$$12 \rightarrow 2 \geq 1 - y \rightarrow -1 \leq y \rightarrow y \geq -1$$

$$13 R_f = [-1, +\infty)$$

$$15 \text{ الف) } y = \frac{x^2 + 3}{x^2 - 1} \rightarrow y(x^2 - 1) = x^2 + 3 \rightarrow yx^2 - x^2 = 2y + 3 \quad (3)$$

$$17 \rightarrow x^2(y-1) = 2y+3 \Rightarrow x^2 = \frac{2y+3}{y-1} \rightarrow x = \sqrt{\frac{2y+3}{y-1}}$$

$$19 \frac{-1.5}{+4} \rightarrow R_f = (-\infty, -1.5] \cup (1, +\infty)$$

PARAMOUNT

(2)

$$\rightarrow y = \frac{r|x| + 1}{|x| - r} \rightarrow y|x| - ry = r|x| + 1 \rightarrow y|x| - r|x| = 1 + ry$$

$$\rightarrow |x| (y - r) = 1 + ry \rightarrow |x| = \frac{1 + ry}{y - r}$$

$$\frac{-\frac{1}{r}}{+ \frac{1}{r} - 0} \rightarrow Rf = IR - \left[-\frac{1}{r}, r \right]$$

$$y = \frac{1}{x^r - rx} \rightarrow 1 = yx^r - ryx$$

$$\rightarrow yx^r - ryx - 1 = 0 \quad \Delta \geq 0$$

$$\rightarrow b^2 - 4ac \geq 0 \rightarrow 14y^2 - 4(1-y) \geq 0$$

$$\rightarrow 14y^2 + 4y \geq 0 \rightarrow 4y(4y + 1) \geq 0 \rightarrow \frac{-\frac{1}{4}}{+ \frac{1}{4} - 1}$$

$$\rightarrow IR = \left[-\frac{1}{4}, 0 \right] \quad Rf = (-\infty, \frac{1}{4}] \cup (0, +\infty)$$

$$(الف) y = x^r - rx + r \quad a > 0 \rightarrow x_{min} = -\frac{b}{2a} = r$$

$$y = 11 + r = -V \quad y_{min} = -V \rightarrow Rf = \left[-V, +\infty \right)$$

$$\rightarrow y = -x^r + rx + r \quad a < 0 \rightarrow x_{max} = -\frac{b}{2a} = r$$

$$y_{max} = -V$$

$$Rf = (-\infty, \frac{1}{4}]$$

1 الف) $y = \sqrt{x^2 - 4x + 2} \quad a > 0 \rightarrow \begin{cases} x_{\min} = -\frac{b}{2a} = 2 \\ y_{\min} = -1 \end{cases}$ (4)

3 $\rightarrow R_f = \sqrt{[-1, +\infty)} = [0, +\infty)$ ✓

5 ب) $y = \sqrt{-x^2 + 4x + 10} \quad a < 0 \rightarrow \begin{cases} x_{\max} = -\frac{b}{2a} = 2 \\ y_{\max} = 14 \end{cases}$ (2)

7 $R_f = \sqrt{(-\infty, 14]} \rightarrow [0, \sqrt{14}]$ ✓

9 الف) $y = x^2 + 3x^4 + 2x + 1$ برگشتن دایره $\rightarrow R_f = \mathbb{R}$ ✓ (5)

11 ب) $y = \sqrt{x^5 + 4x^2 + 6x + 1}$ برگشتن دایره $\rightarrow R_f = \sqrt{\mathbb{R}}$ (2)

12 $\rightarrow R_f = [0, +\infty)$ ✓

14 الف) $y = \frac{3x+1}{x-2}$ همگرایی $\rightarrow R_f = \mathbb{R} - \left\{ \frac{a}{c} \right\}$ (1)

16 $\rightarrow R_f = \mathbb{R} - \left\{ \frac{3}{2} \right\}$ ✓ (2)

18 ب) $y = \sqrt{\frac{5x+1}{x+3}}$ $\rightarrow R_f = \sqrt{\mathbb{R} - 4} \rightarrow R_f = [0, +\infty) - \left\{ \frac{1}{2} \right\}$ ✓

الف) $y = \frac{2x+1}{x-2}$

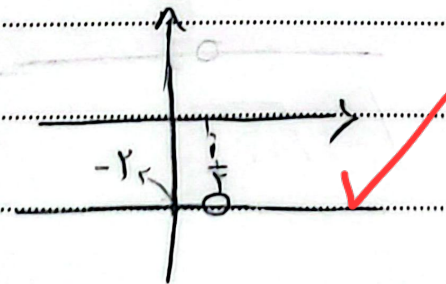
9

$\Rightarrow \begin{cases} \text{جانب مائل} = 2 \\ \text{انحنى} = 2 \end{cases}$



$\rightarrow y = \frac{2x-2}{1-2x} \rightarrow y = \frac{-2(-2x+1)}{-2x+1} \rightarrow y = -2, 1-2x \neq 0$
 $x \neq \frac{1}{2}$

1, 1, 1, 1, 1



الف) $\cos^2 x \neq \frac{1}{\cos^2 x} \rightarrow R_f = [5, +\infty)$

10

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

11

$\rightarrow R_f = (-\infty, \sqrt{-r}] \cup [\sqrt{r}, +\infty)$

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