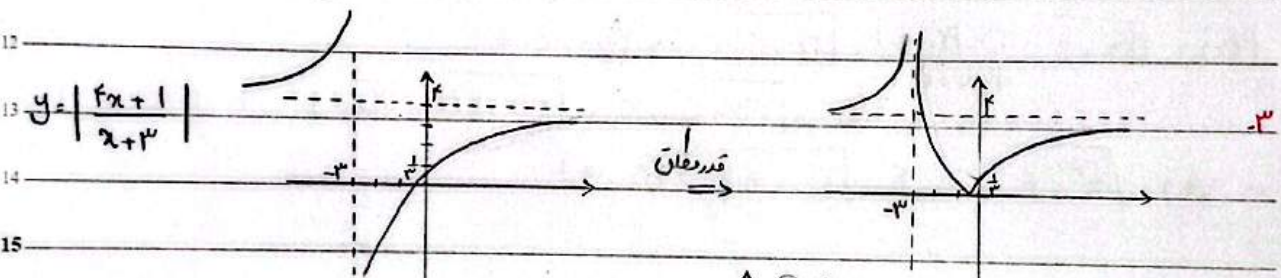


1. $f(x) = 2\sin^2(x + \frac{\pi}{4}) - 1$ $\xrightarrow{\max} \sin^2 = 1 \Rightarrow f(x) = 2 - 1 = 1$
 $\xrightarrow{\min} \sin^2 = 0 \Rightarrow f(x) = 0 - 1 = -1$
 $\Rightarrow R = [-1, 1]$

4. $g(x) = 3\cos^3 x - 4$ $\xrightarrow{\max} \cos x = 1 \Rightarrow g(x) = 3 - 4 = -1$
 $\xrightarrow{\min} \cos x = -1 \Rightarrow g(x) = -3 - 4 = -7$
 $\Rightarrow R = [-7, -1]$

7. $y = \frac{x}{|x|} + [x] \rightarrow -3 < x < -2 \Rightarrow y = -1 - 3 = -4$
 $-2 < x < -1 \Rightarrow y = -1 - 2 = -3$
 $-1 < x < 0 \Rightarrow y = -1 - 1 = -2$
 $0 < x < 1 \Rightarrow y = 1 + 0 = 1$
 $1 < x < 2 \Rightarrow y = 1 + 1 = 2$
 $2 < x < 3 \Rightarrow y = 1 + 2 = 3$
 $x = 3 \Rightarrow y = 1 + 3 = 4$



17. $|x-2| + |y-1| = 3$
 $\begin{matrix} x=2 \\ y=1 \end{matrix}$

19. ① $x > 2, y > 1 \Rightarrow x - 2 + y - 1 = 3 \Rightarrow y = 4 - x$
 20. ② $x < 2, y > 1 \Rightarrow 2 - x + y - 1 = 3 \Rightarrow y = x + 2$
 21. ③ $x < 2, y < 1 \Rightarrow 2 - x + 1 - y = 3 \Rightarrow y = -x$
 22. ④ $x > 2, y < 1 \Rightarrow x - 2 + 1 - y = 3 \Rightarrow y = x - 4$

24. $f(x) = x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}}$ $\sqrt{x + \frac{1}{x}} = t \rightarrow f(x) = t^2 + 2t$ $\xrightarrow{\max} f(x) = +\infty$
 $\xrightarrow{\min} t = -1 \Rightarrow f(x) = 2 + 2\sqrt{2}$
 $\Rightarrow R = [2 + 2\sqrt{2}, +\infty)$



$$y = (r - \sin x)(1 + \sin x) = -\sin^2 x + r \sin x + r \quad \xrightarrow{\max} \sin x = 1 \Rightarrow f(x) = -1 + r + r = r$$

$$\xrightarrow{\frac{b}{r}} \sin x = \frac{-r}{-r} = 1 \Rightarrow f(x) = r$$

$$\xrightarrow{\min} \sin x = -1 \Rightarrow f(x) = -1 - r + r = 0$$

$$\Rightarrow R = [0, +r]$$

$$f(x) = \frac{-1}{r}x + 10$$

$$D_f = \{1, 2, 3, \dots, 9\}$$

$$\begin{aligned} \text{مجموع اعضاء } D_f &= \left(\frac{-1}{r} \times 1 + 10\right) + \left(\frac{-1}{r} \times 2 + 10\right) + \dots + \left(\frac{-1}{r} \times 9 + 10\right) = \frac{-1}{r}(1 + 2 + \dots + 9) + (9 \times 10) \\ &= \frac{-1}{r} \times \frac{9 \times 10}{2} + 90 = -45 + 90 = 45 \end{aligned}$$

باجواب دانه نتيجہ مندرجہ عبارت زیر را در يكال معادله خاص است پس $a=0$

$$f(x) = \sqrt{bx+c} \quad \begin{matrix} D=[r,+\infty) \\ f(r)=0 \end{matrix} \rightarrow \sqrt{rb+c}=0 \Rightarrow rb=-c \quad *$$

$$f(r) = \sqrt{rb+c} = * \rightarrow \sqrt{rb-rb} = \sqrt{b} = 1 \Rightarrow b=1, c=-r$$

$$\Rightarrow g(x) = \sqrt{x^2+r} \Rightarrow R = \sqrt{[r,+\infty)} = [r,+\infty)$$

$$f(x) = \frac{x^3-rx}{x+r} = \frac{x(x^2-r)}{x+r} = \frac{x(x+r)(x-r)}{x+r} = x(x-r) \quad \xrightarrow{a=-r}$$

$$x(x-r) \neq \Lambda \Rightarrow x \neq r, -r \Rightarrow \{a, b\} = \{-r, r\}$$

$$\xrightarrow{x^2-rx} \xrightarrow{x=\frac{b}{r}=1} 1-r=-1 \Rightarrow C=-1$$

$$f\left(\frac{r-r}{-1 \times r}\right) = f(-1) = -1(-1-r) = r$$

$$y = \sqrt[3]{x^3+ax^2+bx-\Lambda} \quad \xrightarrow{\text{مجموع خاص}} \sqrt[3]{(x-r)^3} = x-r$$

$$\hookrightarrow x^3 - 4x^2 + 12x - \Lambda \Rightarrow a=-4 \quad b=12$$

$$\Rightarrow -4 \leq x \leq 12 \Rightarrow -\Lambda \leq x-r \leq 10 \Rightarrow R = [-\Lambda, 10]$$

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$$1 \quad y = [x] + \left[x + \frac{1}{p}\right]$$

$$2 \quad \frac{1}{p} < x < 1 \Rightarrow y = 0 + 1 = 1$$

$$3 \quad 1 \leq x < \frac{p}{p} \Rightarrow y = 1 + 1 = 2$$

$$4 \quad \frac{p}{p} < x < 2 \Rightarrow y = 1 + 2 = 3$$

5

6

