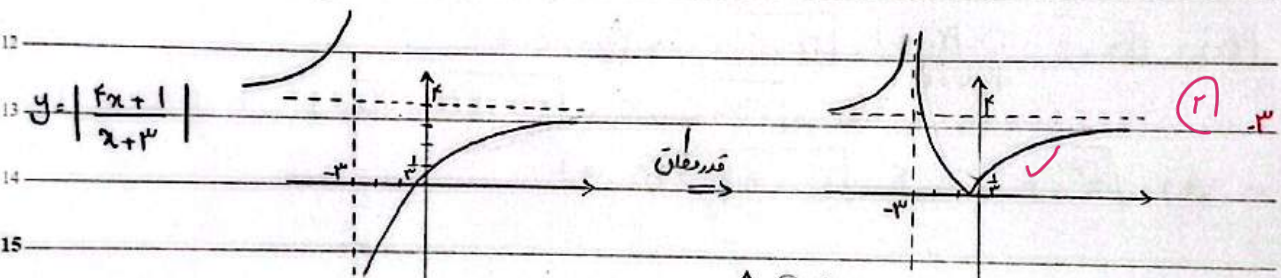


1. $f(x) = 2\sin^2(x + \frac{\pi}{4}) - 1$ $\xrightarrow{\max} \sin^2 = 1 \Rightarrow f(x) = 2 - 1 = 1$ $\xrightarrow{\min} \sin^2 = 0 \Rightarrow f(x) = 0 - 1 = -1$ $\Rightarrow R = [-1, 1]$

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. $x > 2, y > 1 \Rightarrow x - 2 + y - 1 = 3 \Rightarrow y = 6 - x$
 20. $x < 2, y > 1 \Rightarrow 2 - x + y - 1 = 3 \Rightarrow y = x + 2$
 21. $x < 2, y < 1 \Rightarrow 2 - x + 1 - y = 3 \Rightarrow y = -x$
 22. $x > 2, y < 1 \Rightarrow x - 2 + 1 - y = 3 \Rightarrow y = x - 4$

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



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

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

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

$$\Rightarrow R = [0, x]$$

$$f(x) = \frac{-1}{x} x + 10 \quad D_f = \{1, 2, 3, \dots, 9\}$$

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

بانتجه به دانشه نتيجه مناسبت عبارت زیر را در يكال معادله خالص است پس $a=0$

$$f(x) = \sqrt{bx+c} \quad \xrightarrow{D=[x,+\infty)} \sqrt{bx+c} = 0 \Rightarrow bx+c=0 \Rightarrow bx=-c \quad *$$

$$f(x) = \sqrt{bx+c} \quad \xrightarrow{f(x)=*} \sqrt{bx+c} = * \Rightarrow \sqrt{bx-2b} = \sqrt{b} = 1 \Rightarrow b=1, c=-2$$

$$\Rightarrow g(x) = \sqrt{x^2+4} \Rightarrow R = \sqrt{[x,+\infty)} = [2,+\infty)$$

$$f(x) = \frac{x^2-4x}{x+1} = \frac{x(x-4)}{x+1} = \frac{x(x+1)(x-1)}{x+1} = x(x-1) \quad \xrightarrow{a=-1}$$

$$x(x-1) \neq 1 \Rightarrow x \neq 1, -1 \Rightarrow \{a, b\} = \{-1, 1\}$$

$$\xrightarrow{x^2-4x} \xrightarrow{x=\frac{b}{a}=1} 1-4=-3 \Rightarrow C=3$$

$$f\left(\frac{1-1}{-1 \times 1}\right) = f(-1) = -1(-1-1) = 2$$

$$y = \sqrt{x^2+ax^2+bx-1} \quad \xrightarrow{\text{مجموع}} \sqrt{(x-1)^2} = x-1$$

$$\hookrightarrow x^2-4x^2+4x-1 \Rightarrow a=-4 \quad b=4$$

$$\Rightarrow -4 \leq x \leq 4 \Rightarrow -1 \leq x-1 \leq 3 \Rightarrow R = [-1, 3]$$

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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

