

۲۰ آفریقہ کی مملکت تونس! مہم ناجاتی / کالیف نامہ کی ۲

$$f(x) = (x+1)^2 + (3x-1)^2 + mx^2 + nx + mn$$

① ②

$$x^2 + 2x + 1 + 9x^2 - 6x + 1 + mx^2 + nx + mn =$$

$$(10+m)x^2 + (n-4)x + mn + 2 = -3x$$

$$10+m=0 \quad n-4=0$$

$$m=-10 \quad n=4$$

$$g(x) = \{(x, m), (n, p+1), (p+2, -1), (-9, p+k)\}$$

$$(4, -10) \quad (4, p+1) \quad (-9, -1)$$

$$p+1 = -10 \rightarrow p = -11$$

$$p+k = -1 \rightarrow k = 10$$

$$m+n+p+k = -10 + 4 - 11 + 10 = -7$$

$$\text{الف) } y = \sqrt{\frac{x-2}{x^2-2x-1}} \geq 0$$

$$(x^2+2)(x-2)(x+2) \geq 0$$

$$D_f = (-2, +\infty) - \{2\}$$

$$\text{ب) } f(x) = \frac{2x^2+1}{x-2[-x]}$$

$$x-2[-x] \neq 0 \rightarrow x \neq 2 \rightarrow 2 \leq -x < 3 \rightarrow -3 < x \leq -2$$

$$D_f = \mathbb{R} - (-3, 2)$$

الف) $f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}}$

I: $x(x-1)(x+1) > 0$

-1	0	1
-	+	-

II: $|x|+x > 0$

$x > 0 \rightarrow x > 0$

$x \leq 0 \rightarrow 0$

$I \cap II \Rightarrow D_f = [1, +\infty)$ ✓

ب) $f(x) = \frac{\sqrt{|x-2|-x^2}}{|x|-1}$

I: $|x-2|-x^2 > 0$

$x > 2 \rightarrow -x^2+x-2 > 0 \rightarrow \Delta < 0$

$x < 2 \rightarrow -x^2-x+2 > 0 \rightarrow (x-1)(x+2) > 0$

-2	1
-	+

II: $|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1$

$I \cap II \Rightarrow D_f = [-2, 1) \cup (1, +\infty)$ ✓

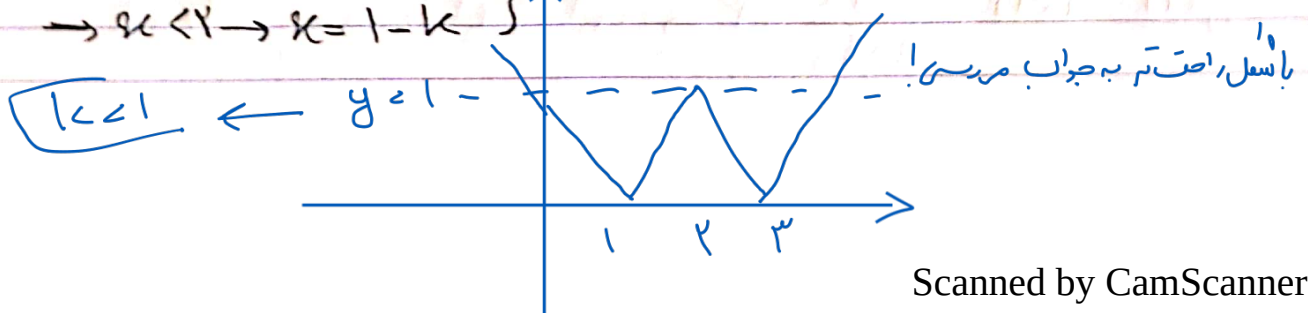
$y = \frac{1}{||x-2|-1|-k}$ $\rightarrow ||x-2|-1|-k = 0 \rightarrow ||x-2|-1| = k$ (۲) (۳)

I) $|x-2|-1 = k \rightarrow |x-2| = k+1$

$\rightarrow x > 2 \rightarrow x = k+3$

$\rightarrow x < 2 \rightarrow x = 1-k$

$k+3 = 1-k \rightarrow k = -1 \rightarrow \times$



$$II) |x-2|-1=-k \rightarrow |x-2|=1-k$$

$$\begin{aligned} \rightarrow x > 2 &\rightarrow x = 3-k \\ \rightarrow x < 2 &\rightarrow x = k+1 \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} \quad 3-k = k+1 \rightarrow \boxed{k=1} \rightarrow \checkmark$$

$$y = 2x - [x] \rightarrow [-2, 2]$$

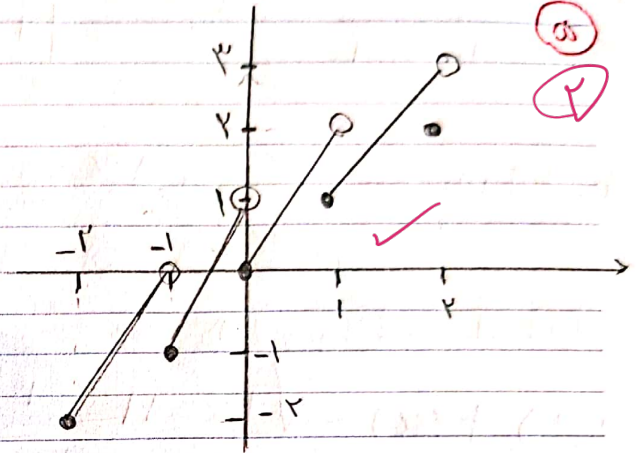
$$-2 \leq x < -1 \rightarrow [x] = -2 \rightarrow 2x + 2$$

$$-1 \leq x < 0 \rightarrow [x] = -1 \rightarrow 2x + 1$$

$$0 \leq x < 1 \rightarrow [x] = 0 \rightarrow 2x$$

$$1 \leq x < 2 \rightarrow [x] = 1 \rightarrow 2x - 1$$

$$x = 2 \rightarrow [x] = 2 \rightarrow 2$$



$$f(x) = \frac{x^2 - 5x + 3}{x + a} + b \rightarrow \text{هانی}$$

$$x=0 \xrightarrow{y=0} \frac{3}{a} + b = 0 \xrightarrow{b=1} \frac{3}{a} = -1 \rightarrow a = -3$$

$$x=1 \xrightarrow{y=1} 0 + b = 1 \rightarrow b = 1 \quad a - b = -3 - 1 = -4 \checkmark$$

$$f(x) = \begin{cases} \frac{x^3 + 2x^2 - x - 2}{x^2 - 1} & ; x \neq \pm 1 \\ \frac{ax + 2}{x + b} & ; x = \pm 1 \end{cases} \quad g(x) = x + c$$

$$\frac{x^3 + 2x^2 - x - 2}{x^2 - 1} = \frac{(x-1)(x+1)(x+2)}{(x-1)(x+1)} = x+2 = x+c \rightarrow \boxed{c=2} \checkmark$$

$$g(1) = f(1) = \frac{a+2}{1+b} = 3 \rightarrow a+2 = 3+3b \rightarrow a-3b = 1$$

$$g(-1) = f(-1) = \frac{-a+2}{-1+b} = 1 \rightarrow -a+2 = -1+b \rightarrow a+b = 3$$

مهر ۱۳۳۶ هجری

روز عرفه - روز ناست

$$\begin{cases} x - 3b = 1 \\ -x - b = 4 \end{cases}$$

$$-x - b = 4 \rightarrow b = +\frac{1}{3} \quad \checkmark$$

$$a = \frac{5}{3}$$

$$b + c = \frac{1}{3} + 2 = \frac{7}{3} = 2\frac{1}{3}$$

$$f(x) = \sqrt{4x - 3a} + k - 1 \quad g(x) = \sqrt{b - 2x} + 3k \quad (2) (A)$$

$$f - g = \{(1, k)\} \rightarrow \text{نقطة اشتراك دالة واحدة في كلتا الدالتين}$$

$$\begin{cases} 4x - 3a \geq 0 \rightarrow x \geq \frac{3a}{4} \\ b - 2x \geq 0 \rightarrow x \leq \frac{b}{2} \end{cases} \quad \frac{3a}{4} = \frac{b}{2} = 1 \rightarrow b = 2 \quad a = \frac{4}{3}$$

$$f(1) - g(1) = \sqrt{4 - 3} + 2k - 1 - \sqrt{2 - 2} - 3k = k \rightarrow 2k = -2 \rightarrow k = -1$$

$$\frac{3a}{4} - \frac{b}{2} - k = 1 - 1 + 1 = 1 \quad \checkmark$$

$$f(x) = \sqrt{m - x} + n \quad g(x) = \sqrt{2x + 2} \quad D_{f \times g} = [-1, 7] \quad (2) (9)$$

$$f - g(x) = 4\sqrt{2}$$

$$D_f \cap D_g = [-1, 7] \quad \begin{cases} m - x \geq 0 \rightarrow x \leq m \\ 2x + 2 \geq 0 \rightarrow x \geq -1 \end{cases} \quad -1 \leq x \leq m \rightarrow m = 7$$

$$\sqrt{7 - 3} + n - \sqrt{2} = 4\sqrt{2} \rightarrow n = 4\sqrt{2} - 2$$

$$m + n = \sqrt{2} - 2 + 7 = \sqrt{2} + 5$$

$$y = (-1)^x (x - [x]) = \frac{1}{2} \rightarrow [-2, 2]$$

$$y = x - [x] = \frac{1}{2}$$

$$-2 \leq x < -1 \rightarrow x+2$$

$$-1 \leq x < 0 \rightarrow x+1$$

$$0 \leq x < 1 \rightarrow x$$

$$1 \leq x < 2 \rightarrow x-1$$

$$x=2 \rightarrow y=0$$

