

شماره تکلیف ۱ آید محترم ار باز هم

$f(x) = \sqrt{1-x^2}$ $fg - 3f = f$ $f = \{(-1,0), (0,1), (1,0)\}$ (1)

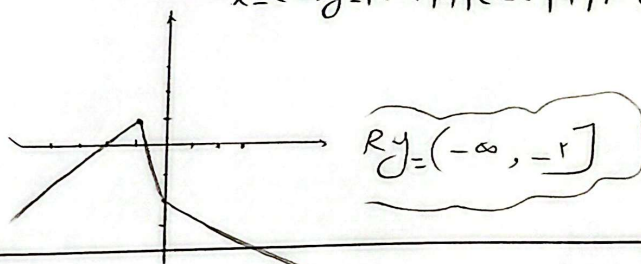
$x = -1 \Rightarrow 1-1=0 \quad (-1,0)$
 $x = 0 \Rightarrow 1-0=1 \quad (0,1)$
 $x = 1 \Rightarrow 1-1=0 \quad (1,0)$
 $fg = (-1,2)(0,1)(1,2)$
 $3f = (-1,0)(0,3)(1,0)$
 $fg - 3f = (-1,2)(0,5)(1,2)$ $R_f = \{2,4,5\}$

$f(x) = 2x-1$ $g(x) = \frac{1}{2}x+3$ $R_f \Rightarrow f(c)-1=5$ $R_g \Rightarrow \frac{1}{2}(c)+3=5$ $R_f \cup R_g = \mathbb{R} - (4,5)$ (2)

$y = \frac{-x^2}{4} + x + 3$ $-\frac{x^2}{4} + x + 3 > \frac{3}{4} \Rightarrow -x^2 + 4x + 12 > 3 \Rightarrow x^2 - 4x - 9 < 0$ (3)

$y = |x-1| + |x-2| + |x-3|$
 $x-1=0 \rightarrow x=1, x-2=0 \rightarrow x=2, x-3=0 \rightarrow x=3$
 $x < 1, 1 \leq x < 2, 2 \leq x < 3, x \geq 3$
 $\text{I } x < 1 \Rightarrow |x-1| = -(x-1) = -x+1$
 $|x-2| = -(x-2) = -x+2$
 $|x-3| = -(x-3) = -x+3$
 $y = 1-x + 2-x + 3-x = 6-3x$
 $\text{II } 1 \leq x < 2 \Rightarrow |x-1| = x-1, |x-2| = -(x-2) = -x+2, |x-3| = -(x-3) = -x+3$
 $y = x-1 - x+2 - x+3 = 4-x$
 $\text{III } 2 \leq x < 3 \Rightarrow |x-1| = x-1, |x-2| = x-2, |x-3| = -(x-3) = -x+3$
 $y = x-1 + x-2 - x+3 = x$
 $\text{IV } x \geq 3 \Rightarrow |x-1| = x-1, |x-2| = x-2, |x-3| = x-3$
 $y = x-1 + x-2 + x-3 = 3x-6$
 $x=1 \Rightarrow y=5, x=2 \Rightarrow y=2, x=3 \Rightarrow y=3$
 $y=2$ (4)

$y = |x-2|/x+1$



$y = \frac{x^2 + 2x + m}{x+1}$ $\frac{x^2 + 2x + m}{x+1} = x + 1 + \frac{m-1}{x+1}$ (5)

$y = x + 1 + \frac{m-1}{x+1}$ $m-1=0 \Rightarrow m=1$ $m=1$ (6)

$$f(x) = \begin{cases} x+2 & ; x \geq 2 \\ x^2 - 2x + 2 & ; 0 \leq x < 2 \\ |x| + 2 & ; x < 0 \end{cases}$$

① $x \leq 2$ $f(x) = x+2 \quad \leftarrow x \rightarrow +\infty \quad f(x) \rightarrow +\infty$
 $x=2 \Rightarrow f(2)=4$
 $Ry = [4, +\infty)$

② $0 \leq x < 2$

③ $x < 0 \rightarrow \text{مثبت}$
 $|x| = -x$

$Ry = (2, +\infty)$

$x = \frac{-b}{2a} = \frac{1}{1} = 1$

$f(0) = 0 - 0 + 2 = 2 \quad Ry = [1, 4)$

$f(1) = 1 - 2 + 2 = 1$

$f(2) = 4 - 4 + 2 = 2$

$Ry = [1, 4) \cup (2, +\infty) \cup [4, +\infty) = [1, +\infty) \rightarrow \text{بایستی}$

$f(x) = \begin{cases} x^2 + 2x + 2 & ; x \leq 0 \\ [2x] - 2x & ; x > 0 \end{cases}$ ① $x \leq 0, a=1$ $f(0) = 0^2 + 0 + 2 = 2$
 $\begin{cases} x = \frac{-b}{2a} = \frac{-1}{1} = -1 \\ y = (-1)^2 + 2(-1) + 2 = -1 \end{cases}$ $Ry = [-1, 2]$

② $x > 0 \rightarrow f(x) = [2x] - 2x \Rightarrow [2x] \leq 2x < [2x] + 1$
 $[2x] - 2x \in (-1, 0]$ $\text{مجموعه دایره ها} \rightarrow (-1, 0] \cup [-1, 2] = [-1, 2] \rightarrow Ry$

$y = a + 1 - \sqrt{2x+2}$ $2x+2 \geq 0 \Rightarrow x \geq -1$ $Dy = [-1, +\infty)$ $b = -\frac{1}{2} \leftarrow \text{طریقت معلول}$
 $ab = 9 \quad y_{\max} = a + 1 - \sqrt{2(-\frac{1}{2}) + 2} = a + 1 - 0 = a + 1$ $x = -\frac{1}{2}$ $\text{بسیار نزدیک به 0 است که}$
 $x \rightarrow +\infty \rightarrow \text{بسیار بزرگ می شود}$

$\sqrt{2x+2} \rightarrow Ry = (-\infty, 1+a]$

$(-\infty, 1+a] \Rightarrow 1+a = 2 \Rightarrow a = 1$

$ab = 2x - \frac{1}{2} = -4 \rightarrow \text{بایستی}$

$f(x) = 2\sqrt{x+1} + 2\sqrt{1-x}$ $y = \frac{f(x)}{4} - \sqrt{2+2\sqrt{1-x^2}} + \frac{f(x)}{2}$

$f(x) + g(x) = 2\sqrt{2+2\sqrt{1-x^2}}$

$g(x) = 2\sqrt{2+2\sqrt{1-x^2}} - f(x)$

$Df = Dg$

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

$= \frac{1}{4} f(x) - \sqrt{2+2\sqrt{1-x^2}} \rightarrow \frac{1}{4} (2\sqrt{x+1} + 2\sqrt{1-x}) - \sqrt{2+2\sqrt{1-x^2}}$

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

$-1 \leq x \leq 1$

$x = 1 \rightarrow 0$

$x = -1 \rightarrow \sqrt{2}$

$x = 0 \rightarrow 1$

$R = [0, \sqrt{2}]$