Subject:
Year. Month. Date.

Sa Su Mo Tu We Th Fr

به نام ایزد

۱- اگر $g=\{(-1,1),(0,4),(2,0),(1,2)\}$, $f(x)=\sqrt{1-x^2}$ آنگاه $2g-3f$

$f(x) \rightarrow 1-x^2 \geq 0 \rightarrow 1 \geq x^2 \rightarrow -1 \leq x \leq 1$

$g \rightarrow \{-1,0,2,1\}$ } اشتراک $\rightarrow \{-1,0,1\}$

$g(-1)=1 \quad f(-1)=0$

$g(0)=4 \quad f(0)=1$

$g(1)=2 \quad f(1)=0$

$2g-3f$: $\{ \rightarrow 4, \rightarrow 2, \rightarrow 0 \}$ $\quad R=\{4,2,0\}$

$4+2+0=11$

۲-

$f(x)=2x-1 \rightarrow [3,+\infty) \rightarrow R=[0,+\infty)$

$g(x)=\frac{1}{2}x+3 \rightarrow (-\infty,3] \rightarrow R=(-\infty,4]$

$R_f \cup R_g = (-\infty,4] \cup [0,+\infty)$

۳-

$y=\frac{-x^2}{2}+x+3 \rightarrow -\frac{1}{2}x^2+x+3$

$x_s=\frac{-1}{-1}=1 \quad , y_s=\frac{7}{2}$

$y>\frac{3}{2} \rightarrow -\frac{1}{2}x^2+x+3>\frac{3}{2} \rightarrow -\frac{1}{2}x^2+x+\frac{3}{2}>0 \rightarrow$

$x^2+2x-3=0 \rightarrow x=1 \xrightarrow{x-1} -1$, $x=-3 \xrightarrow{x-1} 3$

-1		3
$-$	$+$	$-$

$-1<x<3 \longrightarrow (-1,3)=(a,b)$

$\sqrt{b-a}=\sqrt{3-(-1)}=\sqrt{4}=2$

۴- $y = |x-1| + |x-3| + |2x-4|$

$x=1 \quad x=3 \quad x=2$

$x<1$	$1<x<2$	$2<x<3$	$x>3$
$-x+1-x+3$	$x-1-x+3$	$x-1-x+3+$	$x-1+x-3+2x-4=$
$-2x+4=$	$-2x+4=$	$2x-4=$	$4x-8$
$-4x+8$	$-2x+4$	$2x-2$	

$x=1 \longrightarrow 2+2=4$

$x=2 \longrightarrow 1+1=2 \longrightarrow \min$ کمترین مقدار

$x=3 \longrightarrow 2+2=4$

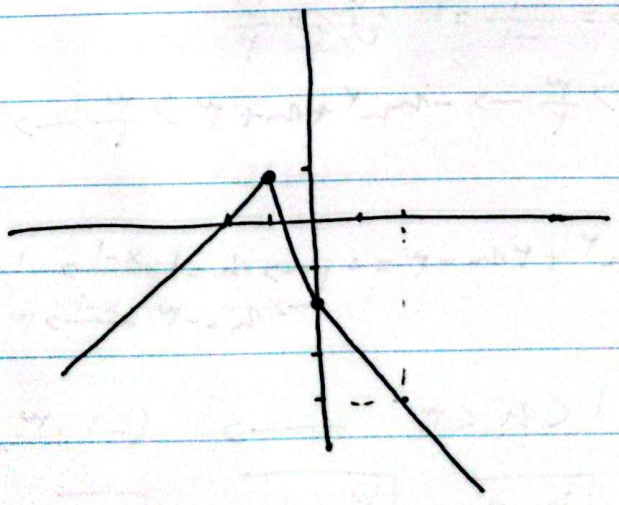
۵- $y = |x|-2|x+1|$

$$y = \begin{cases} -x+2x+2 \\ x+2 \end{cases} \quad ; x<-1$$

$$-x-2x-2=-3x-2 \quad ; -1 \le x \le 0$$

$$x-2x-2=-x-2 \quad ; x>0$$

$Ry = (-\infty, 1]$



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بسم تعالی

۶- $y = \frac{x^2+5x+m}{x+1} \to \frac{x^2+5x+4-4+m}{x+1} = x+4+\frac{m-4}{x+1}$

$x^2+5x+4 = (x+1)(x+4)$

$x+1=x \to x+4+\frac{m-4}{x} \to x \neq 0$

$m-4 \leq 0 \to m \leq 4$

$m = \{1,2,3,4\}$

۷-

$$f(x) = \begin{cases} x+2 & ; x \geq 3 \to R=[3,+\infty) \\ x^2-4x+4 & ; 0 \leq x < 3 \to \frac{-b}{2a} = 1 \to y_s = 1 \to R=[1,3) \\ |x|+2 & ; x < 0 \to R=(0,+\infty) \end{cases}$$

$R_f = [1,+\infty)$ اجتماع

۸-

$$f(x) = \begin{cases} x^2+4x+3 & ; x \leq 0 \to \frac{-b}{2a} = -2, y_s = -1 \to R=[-1,+\infty) \\ [2x]-2x & ; x > 0 \to R=[-1,0) \end{cases}$$

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

پیوستگی

۹.

$y = a+1-\sqrt{2x+3}$

$2x+3 \geq 0 \longrightarrow 2x \geq -3 \longrightarrow x \geq -\frac{3}{2}$

$D_f = [-\frac{3}{2}, +\infty) \longrightarrow b = -\frac{3}{2}$

کوچکترین مقدار $\longrightarrow x = -\frac{3}{2}, \sqrt{2x+3} = 0$

$\sqrt{2x+3} \geq 0 \longrightarrow -\sqrt{2x+3} \leq 0 \longrightarrow a+1-\sqrt{2x+3} \leq a+1 \longrightarrow$

$f(x) \leq a+1$

$R_f = (-\infty, a+1] \longrightarrow a+1 = a \rightarrow a = 4$

$ab = -\frac{3}{2} \times 4 = -6$

۱۰.

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

$f(x)+g(x) = 3\sqrt{2+2\sqrt{1-x^2}}$

$D_f = D_g$

$\frac{f(x)}{4} - \frac{g(x)}{3} \rightarrow \frac{1}{4}\times(2\sqrt{x+1} + 4\sqrt{1-x}) - \frac{1}{3}(3\sqrt{2+2\sqrt{1-x^2}} - 2\sqrt{x+1}$

$-4\sqrt{1-x}) = \frac{1}{3}\sqrt{x+1} + \frac{2}{3}\sqrt{1-x} - \sqrt{2+2\sqrt{1-x^2}} + \frac{2}{3}\sqrt{x+1} + \frac{4}{3}\sqrt{1-x}$

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

$\hookrightarrow (1-x)(1+x)$

$a^2+b^2-2ab \rightarrow (\sqrt{\sqrt{x+1}} - \sqrt{2\sqrt{1-x}})^2$