[illegible] موفقیت ←

۱ ←

$g=\{(-1,1),(0,4),(2,0),(1,2)\}$

$D_f \cap D_g = \{-1,0,1\} \rightarrow 2g-3f = \{(-1,2)(0,5)(1,4)\} \rightarrow$

$2+5+4=11$

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۲ ←

$f(x)=2x-1 \qquad D_f=[3,+\infty) \rightarrow \frac{y+1}{2}=x$

$\rightarrow 3=\frac{y+1}{2} \rightarrow y=5 \rightarrow R_f=[5,+\infty)$ ①

$g(x)=\frac{1}{3}x+3 \qquad D_g=(-\infty,3] \rightarrow 3y-9=x \rightarrow$

$3=3y-9 \rightarrow y=4 \rightarrow R_g=(-\infty,4]$ ②

$\rightarrow$ ① $\cup$ ② $\rightarrow (-\infty,4] \cup [5,+\infty)$

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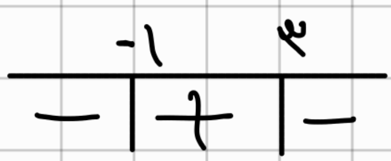
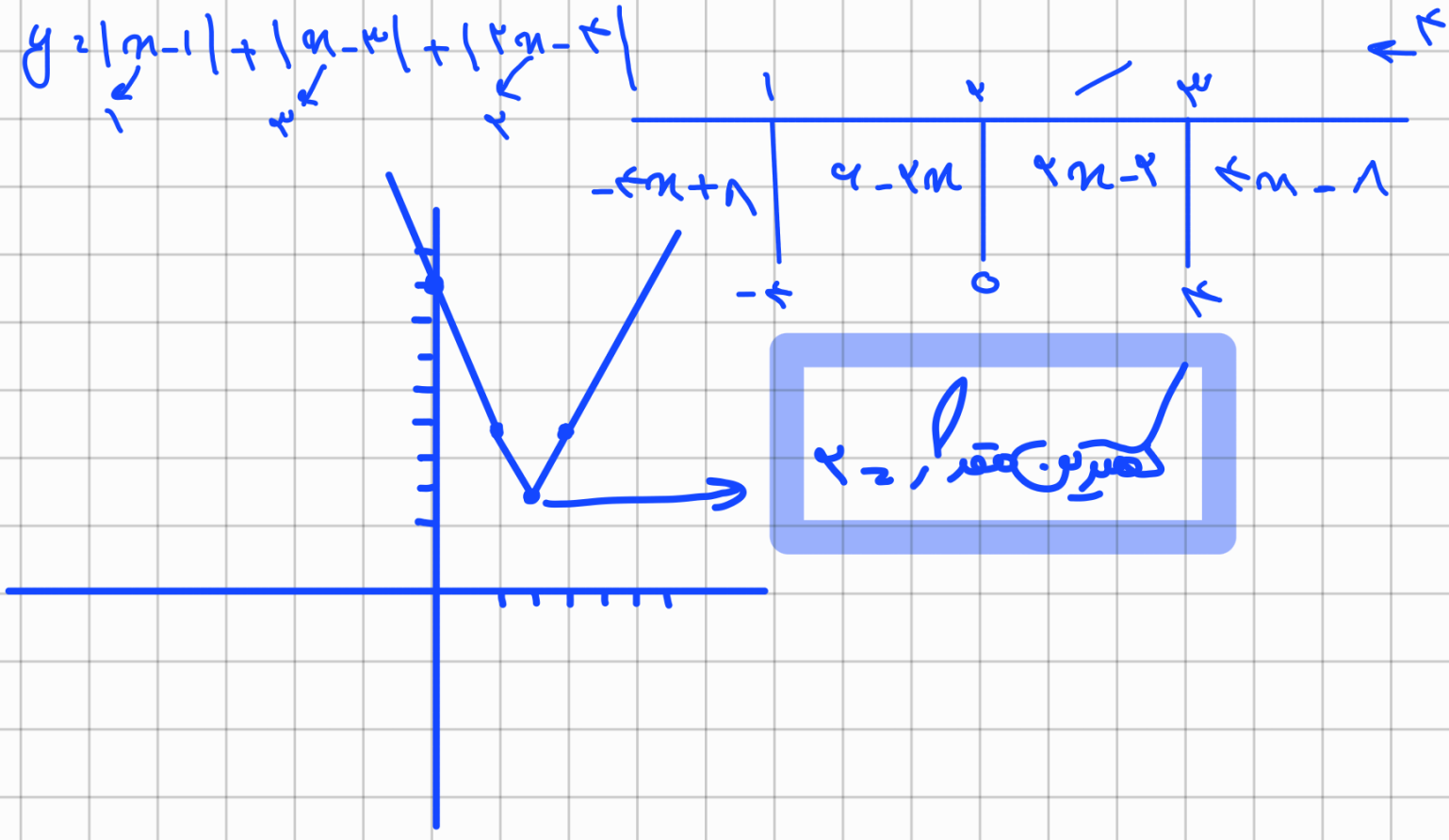
۳ ←

$y=-\frac{x^2}{2}+x+3 \rightarrow -\frac{x^2}{2}+x+3 \geqslant \frac{3}{2} \rightarrow -x^2+2x+6 \geqslant 3$

$\rightarrow -x^2+2x+3 \geqslant 0 \rightarrow$  $\rightarrow (-1,3) \rightarrow$ a = -1, b = 3

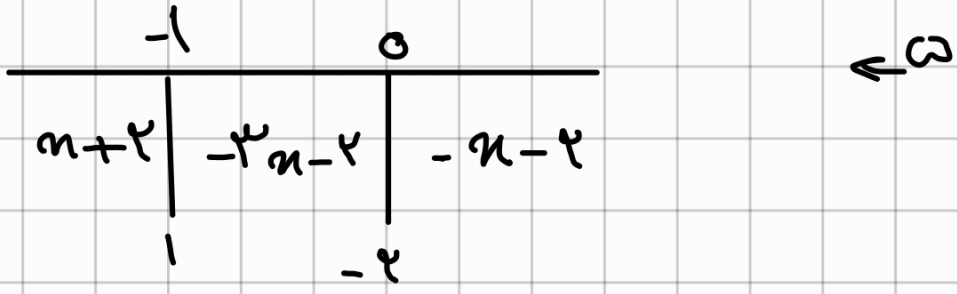
$\sqrt{b-a}=\sqrt{3+1}=2$

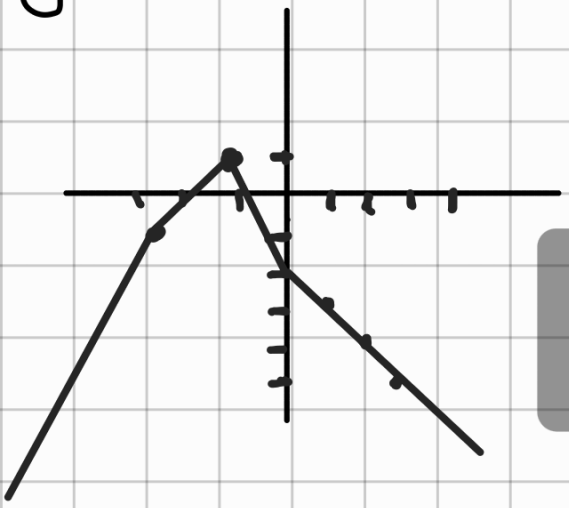
$y = |x-1| + |x-3| + |2x-4|$



کمترین مقدار $= 2$

$y = |x| - 2|x+1|$ →





$R_f = (-\infty, 1]$

$y = \frac{x^2 + 5x + m}{x+1} \Rightarrow yx + y = x^2 + 5x + m \Rightarrow x^2 + (5-y)x + (m-y) = 0$ ← ۶

$(5-y)^2 - 4(m-y) = y^2 - 10y + 25 - 4m + 4y = y^2 - 6y + (25 - 4m)$

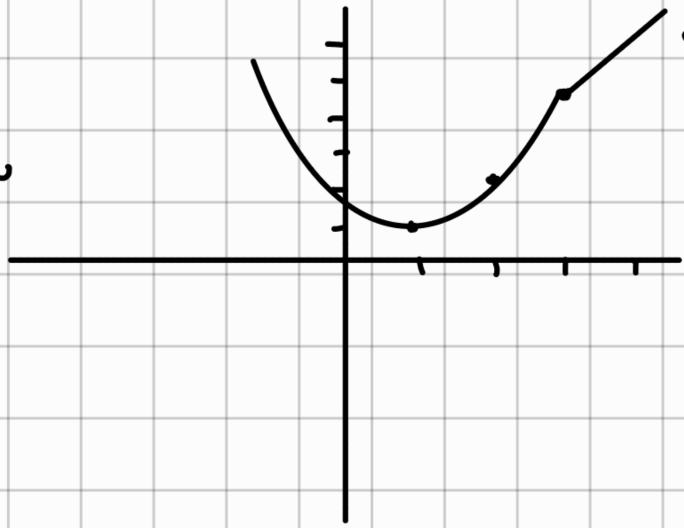
$\xrightarrow{\frac{-b}{2a} = 3} 9 - 6\times 3 + (25 - 4m) = 16 - 4m \geq 0 \rightarrow$

$m \leq 4 \rightarrow x \neq -1 ,\ m = 4 \rightarrow$ مخرج تجزیه شده ← برای ۳ مقدار طبیعی

$\{1, 2, 3\}$ ← m جواب‌ها

← ۷

$$f(x) = \begin{cases} x + 2 & x \geq 3 \\ x^2 - 2x + 2 & 0 \leq x < 3 \\ |x| + 2 & x < 0 \end{cases}$$



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

← ۸

$$f(x) = \begin{cases} x^2 + 4x + 3 & x \leq 0 \\ [2x] - 2x & x > 0 \end{cases}$$

$x > 0 \rightarrow$ همیشه در بازه $(-1, 0]$

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

$g: a+1-\sqrt{2x+3}$ $\quad D_f = [b, +\infty) \rightarrow$ ←9

$2x+3 \geq 0 \rightarrow x \geq -\frac{3}{2} \rightarrow b = -\frac{3}{2}$

$R_f = (-\infty, a] \rightarrow a+1-\sqrt{2x+3} = a \rightarrow$

$a = -\sqrt{2x+3} \rightarrow a < 0 \rightarrow ab = -4$

($2x+3 \geq 0 \rightarrow x \geq -\frac{3}{2}$)

$f(x) = 2\sqrt{x+1} + 2\sqrt{1-x}$ ←10

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

$\frac{f}{2} - \frac{f}{3} - \frac{g(x)}{3} \rightarrow \frac{f}{2} - \left(\frac{f}{3} + \frac{g(x)}{3}\right) \rightarrow$

$\sqrt{x+1} + 2\sqrt{1-x} - \left(\sqrt{2+2\sqrt{1-x^2}}\right) \rightarrow$

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

$1 \rightarrow \sqrt{2} - \sqrt{2} = 0$

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