

$$f(x) = \sqrt{1-x^2} = \left\{ (-1, 0), (0, 1), (1, 0) \right\} \quad g(x) = \left\{ (-1, 1), (0, 4), (2, 0), (4, 2) \right\}$$

$$R_f = \left\{ (-1, 1), (0, 1), (1, 0) \right\} \quad R_g = \left\{ (-1, 1), (0, 4), (2, 0), (4, 2) \right\}$$

$$R_{f \cap g} = \left\{ (-1, 1), (0, 1), (1, 0) \right\}$$

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$$f(x) = 2x - 1 \quad 3 \leq x < +\infty \rightarrow x = 3 \rightarrow f(x) = 4 - 1 = 3 \rightarrow R_f = [3, +\infty)$$

$$g(x) = \frac{1}{x} x + 3 \quad -\infty < x \leq 3 \rightarrow x = 3 \rightarrow \frac{1}{x} x + 3 = 3 + 1 = 4 \rightarrow R_g = (-\infty, 4]$$

$$R_f \cup R_g = (-\infty, 4] \cup [3, +\infty)$$

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$$y = \frac{-x^2}{2} + x + 3 \rightarrow \frac{-x^2}{2} + x + 3 > \frac{x^2}{2} \rightarrow \frac{-x^2}{2} + x + 3 > \frac{x^2}{2} \rightarrow x^2 < 4x - 6$$

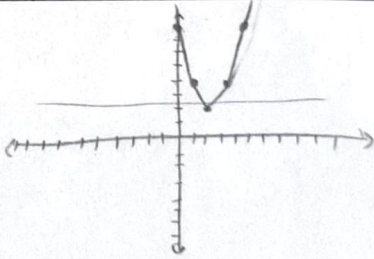
$$-x^2 + 2x + 6 > 0 \rightarrow x^2 - 2x - 6 < 0 \rightarrow (x - 3)(x + 1) < 0$$

$$(a, b) = (-1, 3) \rightarrow \sqrt{b-a} = \sqrt{3+1} = 2$$

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

1	2	3
$x-1$	$x-3$	$2x-4$
$x-1$	$x-3$	$2x-4$
$x-1$	$x-3$	$2x-4$

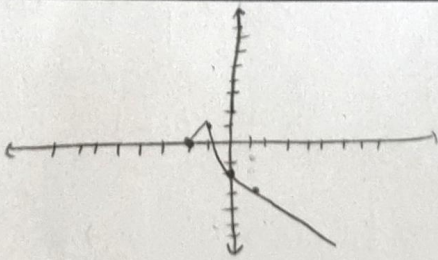


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$$y = |x| - 2|x+1|$$

-1	0
x	$x+1$
x	$x+1$
x	$x+1$



$$R_f = (-\infty, 1]$$

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$y, \frac{a^r + \Delta a + m}{a+1} \rightarrow y a + y, a^r + \Delta a + m \rightarrow a^r + a(\Delta - y) + m - y =$ $a = \frac{-b \pm \sqrt{\Delta}}{r_a} \rightarrow y - \Delta \pm \sqrt{(a-y)^r - r(m-y)} \rightarrow (a-y)^r - r m + r y \geq 0$ $r \Delta + y^r - 1 - y - r m + r y \geq 0 \rightarrow y^r - y - r m + r \Delta \geq 0 \rightarrow \Delta \geq 0$ $r y - r(-r m + r \Delta) \leq 0 \rightarrow m \leq r \rightarrow m \leq r \rightarrow \frac{(a+r)(a+1)}{(a+r)} \leq (a+r) X \rightarrow m \in [1, r]$	6
$f(x) = \begin{cases} a+r & ; a \geq r \\ a^r - r a + r & ; 0 < a < r \\ a + r & ; a < 0 \end{cases} \rightarrow \begin{cases} \frac{-b}{r_a} = \frac{r}{r} = 1, \frac{-\Delta}{r_a} = 1 \end{cases}$ $R_f = [1, +\infty)$	7
$f(x) = \begin{cases} a^r + r a + r & ; a \leq 0 \\ [r a] - r a & ; a > 0 \end{cases} \rightarrow \begin{cases} \frac{-b}{r_a} = \frac{-r}{r} = -1, \frac{-\Delta}{r_a} = -1 \\ 0 \leq a \leq 1 \rightarrow -r a \\ 1 \leq a \leq r \rightarrow r - r a \end{cases}$ $R_f = [-1, +\infty)$	8
$y = a + 1 - \sqrt{r a + r} \rightarrow r a + r \geq 0 \rightarrow r a \geq -r \rightarrow a \geq -\frac{r}{r} \rightarrow b = -\frac{r}{r}$ $a = -\frac{r}{r} \rightarrow y = a + 1 \rightarrow -\infty \leq a + 1 \leq 0 \rightarrow a \leq r$ $a b = r x - \frac{r}{r} = y$	9
$f(x) \leq r \sqrt{a+1} + r \sqrt{1-a} \rightarrow D_f = [-1, 1]$ $y = \frac{f(x)}{4} - \frac{g(x)}{r} = \frac{r \sqrt{a+1} + r \sqrt{1-a}}{4} - \frac{r \sqrt{1-a} + r \sqrt{1+a}}{4} = \frac{r \sqrt{a+1} - r \sqrt{1-a}}{4}$ $\frac{r \sqrt{a+1} + r \sqrt{1-a} + r \sqrt{a+1} + r \sqrt{1-a} - r \sqrt{1-a} - r \sqrt{1+a}}{4} = \frac{r \sqrt{1-a}}{4} \rightarrow \sqrt{1-a} \rightarrow -1 \leq a \leq 1 \Rightarrow$ $R_f = \sqrt{1+1} \leq \sqrt{r}, \sqrt{1-1} \leq \dots \rightarrow [0, \sqrt{r}]$	10