

$$f(x) = \sqrt{1-x^2} \rightarrow 1-x^2 \geq 0 \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1 = D_f$$

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

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$$f(x) = x-1 \rightarrow \text{if } D_f = [2, +\infty) \Rightarrow D_g = [5, +\infty)$$

$$g(x) = \frac{1}{2}x+2 \rightarrow \text{if } D_g = (-\infty, 3] \Rightarrow D_f = (-\infty, 4] \text{ II}$$

$$\text{I} \cup \text{II} \rightarrow \mathbb{R} - (4, 5)$$

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

$$x \mid \frac{-1 \pm \sqrt{1-4 \cdot (-\frac{1}{2}) \cdot 0}}{2 \cdot (-\frac{1}{2})} = \frac{-1 \pm 1}{-1} \Rightarrow \begin{cases} x=0 \\ x=2 \end{cases}$$

$$\frac{3}{2} \times \frac{1}{2} = \left(\frac{3}{4}\right) \quad -\frac{1}{2} \times \frac{1}{2} = \left(-\frac{1}{4}\right) \quad \boxed{\left(-\frac{1}{4}, \frac{3}{4}\right)}$$

$$\text{a} \quad \text{b}$$

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

$$\begin{cases} x > 3 \rightarrow x-1 + x-2 + x-3 = 3x-6 \\ 2 < x < 3 \rightarrow x-1 - x+2 + x-3 = x-2 \\ 1 < x < 2 \rightarrow x-1 - x+2 - x+3 = -x+4 \\ x < 1 \rightarrow -x+1 - x+2 - x+3 = -3x+6 \end{cases}$$

$$f_{\min}^{x=2} (3 \times 2 - 6 = 0)$$

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$$y = |x| - 2|x+1| \begin{cases} x > 0 \rightarrow x - 2x - 2 = -x-2 \\ -1 < x < 0 \rightarrow -x - 2x - 2 = -3x-2 \\ x < -1 \rightarrow -x + 2x + 2 = x+2 \end{cases}$$

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$$y = \frac{x^2 + \Delta x + m}{x+1}$$

$$\Rightarrow x^2 + \Delta x + m = (x+1)y \Rightarrow x^2 + x(\Delta - y) + m - y = 0$$

$$\Delta \geq 0 \Rightarrow \Delta + y^2 - 4y - 4(m-y) = y^2 - 4y + 4\Delta - 4m + 4y = 0$$

$$= y^2 - 4y - 4m + 4\Delta \geq 0 \xrightarrow{\text{معاودة ترتيب}} (y-2)^2 - 4y + 4 \geq 0$$

$$\Rightarrow -4m + 4\Delta = 4 \Rightarrow -4m = 4 - 4\Delta \Rightarrow m = \Delta - 1$$

$$f(x) = \begin{cases} x+2 & x \geq 2 \rightarrow R_f = [\Delta + \infty) \cap \end{cases}$$

$$\begin{cases} x^2 - 2x + 2 & 0 \leq x < 2 \rightarrow \frac{-b}{2a} = \frac{-(-2)}{2} = 1 \xrightarrow{x=1} 1 - 2 + 2 = 1 \rightarrow R_f = [1, \Delta) \cap \end{cases}$$

$$\begin{cases} |x| < 2 & x < 0 \rightarrow |x| + 2 \rightarrow R_f = (2, +\infty) \cap \end{cases}$$

$$\text{I} \cup \text{II} \cup \text{III} \rightarrow [1, +\infty)$$

$$[2n] - 2n \rightarrow R_f = (-1, 0] \cap$$

$$x^2 + 2nx \rightarrow \frac{-b}{2a} = \frac{-2n}{2} = -n \xrightarrow{x=-n} y = (-1 + 2n - 1) \cap [-1, +\infty)$$

$$\text{I} \cup \text{II} \rightarrow [-1, +\infty)$$

$$y = a+1 - \sqrt{2n+2} \quad x = b = -\frac{r}{s} \quad \Delta = a+1 - \sqrt{-r/s}$$

$$\begin{cases} 2n+2 > 0 \\ 2n > -2 \end{cases} \quad \boxed{b = -\frac{r}{s}} \quad \boxed{a = \frac{r}{s}} \Rightarrow a/b = \frac{r/s}{-r/s} = -1$$

$$\boxed{n > -\frac{r}{s}} \rightarrow R_f = [-\frac{r}{s}, +\infty)$$

$$\frac{r}{s} = -\frac{r}{s} = -1$$

$$f(x) = \sqrt{2x+1} + \sqrt{1-x} \rightarrow \begin{cases} 2x+1 \geq 0 & x \geq -1/2 \\ 1-x \geq 0 & x \leq 1 \end{cases} \Rightarrow D_f = [-1/2, 1]$$

$$D_f \cap D_g \Rightarrow D_g = [-1, 1]$$

$$R_f = \{1, 0, \sqrt{2}\}$$

$$\Rightarrow \begin{aligned} x < 0 &\rightarrow f(x) + g(x) = 4 \rightarrow g(x) = 4 - f(x) \\ x = 1 &\rightarrow f(x) + g(x) = \sqrt{2} + \sqrt{1-1} = \sqrt{2} \rightarrow f(x) = \sqrt{2} \\ x = -1/2 &\rightarrow f(x) + g(x) = \sqrt{2(-1/2+1)} + \sqrt{1-(-1/2)} = \sqrt{1} + \sqrt{3/2} = 1 + \sqrt{3/2} \end{aligned}$$

$$\left\{ \frac{f(x)}{g(x)} = \frac{g(x)}{f(x)} = \left\{ \left(\frac{0}{1} \right), \left(\frac{1}{0} \right), \left(\frac{-1}{\sqrt{2}} \right) \right\} \right.$$