

$$x^w f(x+1) \geq 0$$

$$x^w \left(\left(\frac{1}{x} \right)^{x-1} - 1 \right) \geq 0$$

$$x^w (x^{1-x} - 1) \geq 0$$

$$\begin{array}{c} 0 \quad 1 \\ - \quad 0 \quad + \quad 0 \quad - \end{array}$$

$$D_f = [0, 1]$$

$$x + |x+2| \geq 0$$

$$\text{if } x \geq -x$$

$$-x + |2-x| \geq 0$$

$$\begin{array}{c} 2 \\ 2-x \geq 0 \quad -2 \geq 0 \\ \quad \quad \quad \times \end{array}$$

$$2-x \geq 0$$

$$2 \geq x$$

$$1 \geq x$$

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

$$\begin{array}{c} -1 \quad 1 \quad 2 \quad 3 \\ - \quad \frac{1}{3} \quad + \quad 0 \quad - \quad \frac{1}{3} \quad + \quad \frac{1}{3} \quad - \end{array}$$

$$\frac{x-1}{f(x)} \geq 0$$

$$D_f = (-1, 1] \cup (2, 3)$$

$$9x^4 - \sqrt{2}x^3 - 4x - 2 = (x^2 + ax + b)(x^2 + cx + d)$$

$$9ax^3 + 9cx^3 = 0x^3$$

$$9a + 9c = 0$$

$$-a = c$$

$$bd = -2$$

$$\begin{cases} 1, -2 \\ -1, 2 \end{cases}$$

$$(d+b)x = -4x$$

$$ad + bc = -4$$

$$ad - db = -4$$

$$d(d-b) = -4$$

$$d = -1$$

$$b = -2$$

$$x^2(3d + dc + 3b) = -\sqrt{2}x^2$$

$$3d + dc + 3b = -\sqrt{2}$$

$$3d - d^2 + 3b = -\sqrt{2}$$

$$\sqrt{2} = 2$$

~~$$x^w f(x+1) \geq 0$$~~

$$x^w \left(x^4 + x - \frac{4x}{x^w} - \frac{2}{x} \right) \geq 0 \quad x \neq 0$$

$$x^4 + x^5 - 4x - 2x^2 = (x^2 - 2)(x^2 + 19 + 4x^2) + x^2(x^2 - 2)$$

$$(x^2 - 2)(x^2 + 20x^2 + 19) \geq 0$$

$$= 20x^4 + 19x^2 - 2$$

$$x^2 - 2 \geq 0$$

$$(x+2)(x-2) \geq 0$$

$$\begin{array}{c} -2 \quad 2 \\ + \quad 1 \quad - \quad 1 \quad + \end{array}$$

$$D_f = \mathbb{R} - (-2, 2)$$

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

$$x=2 \quad f(2) = 2-1=1$$

$$f(1) + f(2) = 0+1=1$$

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

$$g(x) = (x+1)^2 - 1$$

$$\frac{(1\sqrt{1-1+1})^2 - 1}{(1\sqrt{1+1-1})^2 + 1} = \frac{-1}{1} = -1$$

$$f(x) = \sqrt{x-1+1\sqrt{x-1+1}} = \sqrt{(\sqrt{x-1+1})^2} = |\sqrt{x-1+1}| \Rightarrow \sqrt{x-1+1} \quad x \geq 1$$

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

$$f(x) + g(x) = \sqrt{x-1+1} + \sqrt{x-1-1} = 2\sqrt{x-1} \quad \begin{matrix} c=-1 \\ b=1 \\ d=0 \end{matrix} \quad \frac{0+1}{-1} = -1$$

$$f(x) = \frac{x+1}{(x-1)(x+1)}$$

$$\frac{1+1}{(1-1)(1+1)} = \frac{2}{0} = \infty$$

$$(1, \infty) \quad x$$

$$(1, 0) \quad x$$

$$\frac{0+1}{(0-1)(0+1)} = \frac{1}{-1} = -1$$

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

$$الف: \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), (2, 2), \left(-\frac{1}{2}, 4 \right) \right\}$$

$$ب: \left\{ (1, 2), (\sqrt{2}, -1), (2, 2) \right\}$$

$$ج: \left\{ (1, 9), (3, -1), (4, 9), (-1, \sqrt{3}) \right\}$$

$$د: \left\{ (1, -4), (3, -1) \right\}$$