

$$f(x) = \begin{cases} (x+1)(x+2) & , x > 1 \\ 3x+2 & , x \leq 1 \end{cases}$$

$$\begin{aligned} 2f(0) &= f(-2) + a \Rightarrow 2(a+1) = a + 3a + 2 \\ \Rightarrow 2a + 2 &= 4a + 2 \Rightarrow a = -1 \end{aligned}$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + x \Rightarrow f(x) = f\left(\frac{1}{x}\right)$$

$$\begin{aligned} (\sqrt{x}-\sqrt{y})(\sqrt{x}+\sqrt{y}) &= 1 \Rightarrow \sqrt{x}-\sqrt{y} = \frac{1}{\sqrt{x}+\sqrt{y}} \Rightarrow f(\sqrt{x}-\sqrt{y}) + f(\sqrt{x}+\sqrt{y}) = 2f\left(\frac{1}{\sqrt{x}+\sqrt{y}}\right) \\ \Rightarrow \sqrt{x}-\sqrt{y} &= \frac{(\sqrt{x}+\sqrt{y}+1)^2}{\sqrt{x}+\sqrt{y}} = 2 + \sqrt{4} \end{aligned}$$

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

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

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

$$4f(x) = 4x^2 + x \Rightarrow f(x) = x^2 + \frac{x}{4}$$

$$(x+y)f(x) - xy f(x+y) = 2x^2 - mx + ym + 1$$

$$x=0 : f(0) = \frac{ym-1}{y} \Rightarrow \frac{ym-1}{y} = \frac{ym+1}{4}$$

$$x=-y : f(0) = \frac{ym+1}{y}$$

$$\Rightarrow m = 2 \Rightarrow f(0) = \frac{4 \times 2 - 1}{4} = \frac{7}{4}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{4x^2 + 1}{x}$$

$$f(-1) = 2$$

$$x = -1 \Rightarrow 2f(-1) = \frac{4 + 1 + 1}{-1} \Rightarrow f(-1) = -9$$

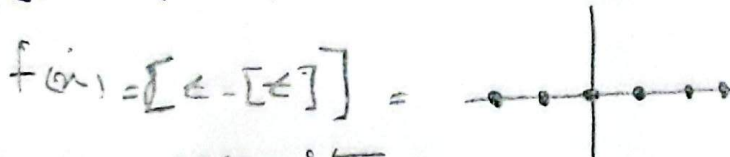
$$\begin{cases} f(x) = (x-1)\sqrt{x(1-x)} & D_f = (-\infty, 1] \\ g(x) = -\sqrt{(1-x)^3} & D_g = (-\infty, 1] \end{cases}$$

نوع دایره و دایره
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 $f = g \Rightarrow$

$$\begin{cases} f(x) = x\sqrt{x} \Rightarrow D_f = x \geq 0 \\ g(x) = \sqrt{x^3} \Rightarrow D_g = x \geq 0 \end{cases}$$

$\Rightarrow f = g$ نوع دایره و دایره

$$\begin{cases} f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \\ g(x) = \sqrt{x - \lfloor x \rfloor} \end{cases} \quad D_g = D_f = [0, +\infty)$$



$g(x) =$

$0 = \text{نوع دایره و دایره}$
 $1 = \text{نوع دایره و دایره}$

$\Rightarrow f = g = 0$

الف) $g = \{(-1, 1), (1, 1), (x, x), (x, 0), (0, x), (0, 0)\}$
 $\sqrt{x}, 1\}$

ب) $\left(\frac{f+g}{f-g}\right)(1) = \frac{1+1}{1-1} = \infty$

ج) $\left(\frac{f+g}{f-g}\right)(x) = \frac{x+x}{x-x} = \frac{x}{0} = \infty$

د) $f(0)g(-1) = 0 \times 1 = 0$

$f(x) = \{(x, 1), (-1, x), (0, x), (-x, x), (x, -1)\}$

ه) $g(x) = f(x-1) \Rightarrow g(x) = \{(1, 1), (0, x), (x, 0), (-x, x), (x, -1)\}$

و) $h(x) = f(|x|) \Rightarrow h(x) = \{(x, 1), (0, x), (x, -1)\}$