

$$\begin{aligned} \rightarrow \text{as } 1 \text{ into } 1 \text{ below} \rightarrow P(a) &= (a+1)(a+2) = a^2 + 3a + 2 \\ P(a) &= 15a + 18 \rightarrow -P(a) \rightarrow f(-2) = 15(-2) + 18 = -30 + 18 = -12 \\ 15a + 18 &= -12 \rightarrow 15a = -30 \rightarrow a = -2 \end{aligned} \quad (1)$$

$$\begin{aligned} (1-\sqrt{2})(1+\sqrt{2}) &= 1 \rightarrow \frac{1}{1-\sqrt{2}} = \frac{1+\sqrt{2}}{(1-\sqrt{2})(1+\sqrt{2})} = 1+\sqrt{2} \\ f(1-\sqrt{2}) + f(1+\sqrt{2}) &\rightarrow \frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}} + 2 + \frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}} + 2 \rightarrow 2\left(\frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}}\right) + 4 \\ \left(\frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}}\right) &\rightarrow \frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}} + 2 \rightarrow \left(\frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}}\right) + 2 = 4 \\ \frac{1}{1-\sqrt{2}} + \frac{1}{1+\sqrt{2}} &= 2 \rightarrow \boxed{2 + 2\sqrt{2}} \end{aligned} \quad (2)$$

$$\begin{aligned} x \rightarrow -x \quad \left\{ \begin{aligned} &4x^2 f(x) - 2f(-x) = 2x^2 - x \\ &2x^2 f(x) + 4f(-x) = 2x^2 + x \end{aligned} \right. \Rightarrow \begin{aligned} &4f(x) - 4f(-x) = 1x^2 - 2x \\ &-4f(x) + 4f(-x) = 1x^2 + 2x \end{aligned} \quad (3) \end{aligned}$$

$$f(x) = -\frac{1}{4}x^2 - \frac{x}{4}$$

4f
4f

$$(x+y)f(x) - yx f(x+y) = \varepsilon x^y - m x + y m - 1 \quad (4)$$

$$f(0) = ? \quad x+y=0 \rightarrow x=-y \rightarrow x=0 \rightarrow y f(x) - y m - 1$$

$$f(0) = \frac{y m - 1}{y} \rightarrow x = -y \rightarrow y f(0) = 1 y - y m + y - 1$$

$$f(0) = \frac{1}{y} (y f(0)) = \frac{a}{y} m + \frac{1}{14} \rightarrow y \left(\frac{y m - 1}{y} \right) = -m + 1$$

$$y m = 1 \wedge \rightarrow m = \frac{1}{\varepsilon} \rightarrow f(0) = \frac{1}{\varepsilon} \left(\frac{1}{\varepsilon} \right) - 1 = \frac{1}{\varepsilon^2} - 1$$

$$f(x) = ax + b \rightarrow f(x) + f\left(\frac{1}{x}\right) = \frac{y x^y - 1 y x + y}{x} \quad (5)$$

$$= \frac{y}{a} x - 1 y + \frac{y}{x} \rightarrow f(x) + \left(\frac{1}{x}\right) f = ax + b + \frac{a}{x} + b = ax + \frac{a}{x} + 2b - y$$

$$\rightarrow a = y \rightarrow y b = -y \rightarrow b = -1 \quad f(x) = yx - 1$$

$$f(1) = y - 1 = 4 - 1 = 3$$

$$\sqrt{1-x} \quad y_0 = x \leq 1 \rightarrow Df = (-\infty, 1] \quad (6)$$

$$g(x) = -\sqrt{(1-x)^y} \rightarrow (1-x)^y \quad y_0 \rightarrow 1-x \leq 1 \rightarrow x \geq 0$$

$(x=1)$! not a solution $Df = Dg \rightarrow g(x)$

$$\text{مثلاً: } x=1 \quad x=1$$

$$f(x) \rightarrow x \neq 0 \rightarrow [0, +\infty) \quad , \quad x \neq 0 \rightarrow [0, +\infty) \quad (7)$$

$$g(x) \rightarrow$$

$$f(x) \rightarrow x \neq 0 \rightarrow [0, +\infty) \quad \left\{ \begin{array}{l} g(x) \rightarrow |x| - x \\ |x| - x = 0 \end{array} \right. \quad (8)$$

$$x < 0 \rightarrow |x| = -x \rightarrow x - |x| = x - (-x) = 2x$$

$$x < 0 \rightarrow Dg = [0, +\infty) \xrightarrow{\text{مثلاً}}$$

$$\text{الف) } \left(\frac{f+g}{f-g} \right)(1) \Rightarrow f(1)=2, g(1)=1 \rightarrow \frac{2+1}{2-1} = 3 \quad (9)$$

$$\text{ب) } \left(\frac{f+g}{f-g} \right)(2) \Rightarrow f(2)=3, g(2)=2 \rightarrow \text{تعريف جديد}$$

$$\text{ج) } g(-1)=1, f(g(-1))=f(1) \rightarrow 2$$

$$\text{الف) } 2x-1=2 \rightarrow x=1 \rightarrow g(1)=f(2)=1 \quad (10)$$

$$2x-1=-1 \rightarrow x=0 \rightarrow g(0)=f(-1)=2$$

$$2x-1=0 \rightarrow x=\frac{1}{2} \rightarrow g\left(\frac{1}{2}\right)=f(0)=\infty$$

$$2x-1=-2 \rightarrow x=-\frac{1}{2} \rightarrow g\left(-\frac{1}{2}\right)=f(-2)=2$$

$$2x-1=3 \rightarrow x=\frac{4}{2} \rightarrow g\left(\frac{4}{2}\right)=f(3)=-1$$

$$\left\{ (1, 2), (0, 2), \left(\frac{1}{2}, \infty\right), \left(-\frac{1}{2}, 2\right), \left(\frac{4}{2}, -1\right) \right\}$$

$$\text{ب) } f(0)=\infty \quad \left\{ \begin{array}{l} f(2)=1 \rightarrow |2|=|-2|=2 \\ f(2)=-1 \end{array} \right. \quad \left\{ (0, \infty), (2, 1), (-2, 1), (2, -1), (-2, -1) \right\}$$