

$$\text{f of } \left(\frac{1}{\sqrt{3}}\right) \rightarrow \frac{u \times x}{x^2 \times 3} = \cot \frac{\pi}{4} = \sqrt{3} \Rightarrow \sqrt{3+1} = 2$$

$$\text{f of } \left(\frac{1}{\sqrt{3}}\right) = 2$$

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الف) $g\left(\frac{\pi}{4}\right) = 2 \cos^2 \frac{\pi}{4} = \frac{1}{2} \Rightarrow \frac{1}{2} = \frac{1}{n} \Rightarrow n = 2 \quad f\left(\frac{1}{n}\right) = \sqrt{\frac{4-1}{2 \times 2}}$

$$\text{f of } \left(\frac{\pi}{4}\right) = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$$

ب) $g(\sqrt{2}) = \frac{\sqrt{2}}{1-\sqrt{2}} = \frac{\sqrt{2}(\sqrt{2}+1)}{2-1} = -2+\sqrt{2} \Rightarrow f(-2+\sqrt{2}) = [-2+\sqrt{2}] = -2$

$$\text{f of } (\sqrt{2}) = -2$$

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$$f\left(\frac{\pi}{4}\right) = \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

$$g\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}}{2} \times \sqrt{1-\frac{1}{2}} = \frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{2}} = \frac{1}{2}$$

$$\text{f of } \left(\frac{\pi}{4}\right) = \frac{1}{2}$$

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الف) $\text{f of } (m) = \{(4, 5), (2, 5), (6, 12), (1, 12)\}$

ب) $g \text{ of } (m) = \{\} = \emptyset$

ج) $\text{f of } (n) = \{\} = \emptyset$

د) $g \text{ of } (m) = \{(4, 1), (6, 4), (2, 10)\}$

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$$a = 4 \Rightarrow g(4, 2) = f(m)$$

$$b = 5 = f(m) \Rightarrow g(m) = (b, 1) \Rightarrow (a, b) = (4, 5)$$

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$$a(an+b)+b=pm+r \Rightarrow a^2m+ab+b=pm+r \quad a=p \Rightarrow b=1$$

$$a=-p \Rightarrow b=-1$$

$$\textcircled{1} f(m) = pm+1 \quad \textcircled{2} f(m) = -pm-p$$

$$\textcircled{1} \Rightarrow f(-1) = -1 \quad g(-1) \Rightarrow pm+r = -1 \quad m=-1 \Rightarrow p(-1)+r = -1 \Rightarrow -p+r = -1 \Rightarrow r = p-1$$

$$\textcircled{2} \Rightarrow f(-1) = -1 \Rightarrow g \circ f(-1) = -1$$

$$g \circ f(m) \Rightarrow R_f \subseteq D_g \Rightarrow D_g = \mathbb{R} - \{0, 1\}$$

$$\textcircled{1} \sqrt{n+|n|} \neq 0, 1 \Rightarrow n \neq 1, n \neq -1 \quad n \neq 0 \Rightarrow$$

$$D_{g \circ f} = (0, +\infty) - \{1\}$$

$$D_g = [0, +\infty) \quad D_f = [-1, 1] \quad D_{f \circ g} = [0, 1]$$

$$\Rightarrow R_f \subseteq D_{f \circ g} \Rightarrow 0 \leq \sqrt{1-m^2} \leq 1 \Rightarrow 1-m^2 \leq 1$$

$$\Rightarrow D_f = [-1, 1] \Rightarrow D_{(f \circ g) \circ f} = [-1, 1]$$

$$\text{الف) } \frac{pm+1}{n-p} = t \quad n = \frac{pt+1}{t-p} \Rightarrow p \left(\frac{pt+1}{t-p} \right) + 1 = \frac{1pt-1}{t-p} = f(t)$$

$$f(m) = \frac{pm-1}{m-p}$$

$$\therefore f\left(\frac{m+\frac{1}{m}}{t}\right) = m^2 + \frac{1}{m^2} \Rightarrow f(t) = t^2 - pt \Rightarrow f(m) = m^2 - pm$$

$$m^2 + \frac{1}{m^2} + p\left(m + \frac{1}{m}\right) \Rightarrow t^2 - pt$$

$$f(m) = m, \sqrt{m} = 1 \Rightarrow m = 1$$

$$f(m) = m, \sqrt{m} = 1 \Rightarrow m = 1$$

$$m_1 - \frac{1}{m_1} = 1$$

مطلوب