

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

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

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

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

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

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

$$f\left(\frac{\pi}{4}\right) = \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2} \quad g\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}}{2} \times \sqrt{1-\frac{1}{2}} = \frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{2}} = \frac{1}{2}$$

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

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

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

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

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

$$a = 4 \Rightarrow \text{g of } (4, 2) = \underset{f(m)}{f(m)} (4, 2)$$

$$b = 5 = \underset{f(m)}{f(m)} (4, 5) \Rightarrow \text{g of } (4, 5) = \underset{a}{a} (4, 1) \Rightarrow (a, b) = (4, 5)$$

$$a(an+b)+b = \sqrt{m} + \sqrt{r} \Rightarrow a^2m + ab + b = \sqrt{m} + \sqrt{r} \quad a=\sqrt{r} \Rightarrow b=1$$

$$\textcircled{1} f(m) = \sqrt{m} + 1 \quad \textcircled{2} f(m) = -\sqrt{m} - \sqrt{r} \quad a=-\sqrt{r} \Rightarrow b=-\sqrt{r}$$

$$\textcircled{1} \Rightarrow f(-1) = -1 \quad g(-1) \Rightarrow \sqrt{m} + \sqrt{r} = -1 \Rightarrow -\sqrt{r} \Rightarrow \sqrt{(-1)} - \sqrt{r} = \underline{-1} = g \circ f(-1)$$

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

$$g \circ f(m) \Rightarrow \text{Domain } R_f \subseteq D_g \Rightarrow D_g = R - \{0, r\}$$

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

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

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

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

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

$$\text{الف) } \frac{\sqrt{m}+1}{m-r} = t \quad n = \frac{t^2+1}{t-r} \rightarrow \sqrt{\frac{t^2+1}{t-r}} + 1 = \frac{1 \cdot t - 1}{t-r} = f(t)$$

$$f(m) = \frac{\sqrt{m}-1}{m-r}$$

$$\therefore f\left(\frac{m}{n}\right) = \frac{\sqrt{\frac{m}{n}}}{\frac{m}{n}-r} = \frac{\sqrt{m}}{\sqrt{n}} \cdot \frac{1}{\frac{m}{n}-r} \Rightarrow f(t) = \frac{t^2-r}{t^2-rt} \Rightarrow f(m) = \frac{m^2-r}{m^2-rt}$$

$$\frac{m^2-r}{m^2-rt} + r\left(\frac{m}{n} + \frac{1}{m}\right) \Rightarrow t^2 - rt$$

$$f(n_1) = n_1 \sqrt{n_1} = \sqrt{r} \Rightarrow n_1 = r$$

$$f(n_2) = n_2 \sqrt{n_2} = 1 \Rightarrow n_2 = 1$$

$$\frac{r}{n_1} - \frac{1}{n_2} = 1$$

محل