

$$\cot \frac{\pi}{4} \times \frac{2}{3} = \cot \frac{\pi}{6} = \sqrt{3}$$

$$\sqrt{(\sqrt{3})^2 + 1} = 2$$

الف: $2 \cos^2 \frac{\pi}{6} = 2 \times \left(\frac{1}{2}\right)^2 = \frac{1}{2}$

$$\sqrt{\frac{2 \times 2 - 1}{4}} = \frac{\sqrt{3}}{2}$$

$$\therefore \frac{\sqrt{2}}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}} = \frac{2+\sqrt{2}}{1-2} = -2-\sqrt{2}$$

$$[-2-\sqrt{2}] = -4$$

$$\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

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

الف: $\{(4, 5) (2, 5) (9, 12) (8, 12)\}$

ب: $\emptyset$ ج: $\emptyset$

د: $\{(4, 8) (2, 9) (9, 10)\}$

$$(a, 3) (3, 2)$$

$$a = 3$$

$$(4, b) (b, 1)$$

$$b = 5$$

$$(a, b) = (3, 5)$$

$$ax+b$$

$$x=ax+b$$

$$a(ax+b)+b = a^2x+ab+b$$

$$a^2x+ab+b = rx+r$$

$$a=r \quad r b=r$$

$$b=1$$

$$rx+r=-1 \quad rx=-r \quad x=-r$$

$$rx-r=(r-r)-r = -r = -1$$

$$f(x) = rx+1 \quad r(-1)+1=-1$$

$$x \in D_f \quad x \in \mathbb{R}$$

$$f(x) \in D_g \quad D_g = \frac{1}{x(x-r)} \quad D_g = \mathbb{R} - \{0, r\}$$

$$\sqrt{x+|x|} \begin{cases} \nearrow x=-x \\ \rightarrow x=0 \\ \searrow x=x \end{cases}$$

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

$$x \in D_f \quad x \in [-1, 1]$$

$$D_f = [-1, 1]$$

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

$$f(x) \in D_{f \circ g}$$

$$\sqrt{1-x^2} \in D_{\sqrt{x} + \sqrt{1-x^2}}$$

$$[0, +\infty) \cap [-1, 1] = [0, 1]$$

$$0 \leq 1-x^2 \leq 1 \quad -1 \leq x \leq 1$$

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

$$\text{all: } t = \frac{rx+1}{x-r}$$

$$t(x-r) = rx+1$$

$$tx - rx = 1 + rt$$

$$x = \frac{rt+1}{t-r}$$

$$tx - rt = rx+1$$

$$x(t-r) = rt+1$$

$$f(t) = r \left(\frac{rt+1}{t-r} \right) + 1 = \frac{rt+rt+1}{t-r} = \frac{2rt+1}{t-r}$$

$$f(t) = \frac{1^2t-11}{t-1^2}$$

$$f(x) = \frac{1^2x-11}{x-1^2}$$

$$\therefore t = x + \frac{1}{x}$$

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

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

$$f(t) = t^2 - 2t \quad f(x) = x^2 - 2x$$

$$g(x) \rightarrow \begin{bmatrix} 1 \\ 0 \end{bmatrix} \begin{bmatrix} \sqrt{x} \\ 0 \end{bmatrix}$$

$$x_2 - x_1 = 1 - 1 = 0$$

$$g \circ f(x)$$

$$1, \sqrt{x}$$

$$f(x) = 1, \sqrt{x}$$

$$x\sqrt{x} = 1$$

$$x\sqrt{x} = \sqrt{x}$$

$$x_1 = 1$$

$$x_2 = 1$$