

$$\rightarrow 2y = 3x - 1 \rightarrow 3x - 2y = 1 \rightarrow 3y - 2x = 1 \quad (1)$$

$$\left. \begin{array}{l} x = \dots \rightarrow y = \frac{1}{2} \\ y = \dots \rightarrow x = -\frac{1}{2} \end{array} \right\} \rightarrow S = \frac{\frac{1}{2} \times \frac{1}{2}}{2} = \frac{1}{12}$$

$$y = (x-1)^2 + 2, x \geq 1 \rightarrow (x-1)^2 = y-2 - \sqrt{y-2} = |x-1| \quad (2)$$

$$x \geq 1 \rightarrow x-1 = \sqrt{y-2} \rightarrow x = 1 + \sqrt{y-2} \rightarrow y = 1 + \sqrt{x-2} = f^{-1}(x)$$

$$D_{f^{-1}} = [2, +\infty)$$

$$y_1 = y_2 \rightarrow (x_1-1)^2 + 2 = (x_2-1)^2 + 2 \rightarrow |x_1-1| = |x_2-1| \rightarrow x_1 = x_2$$

$$x_1, x_2 \geq 1$$

$$y_1 = y_2 \rightarrow (x_1-1)^2 + 2 = (x_2-1)^2 + 2 \rightarrow |x_1-1| = |x_2-1| \rightarrow x_1 = x_2$$

$$x_1, x_2 \geq 2 > 1$$

$$x \geq 2 \rightarrow (x-1) \geq 1 \rightarrow x^2 - 2x + 1 \geq 1 \rightarrow x^2 - 2x \geq 0 \rightarrow x \geq 2$$

$$y = (x-1)^2 + 2 \rightarrow |x-1| = \sqrt{y-2} \rightarrow x = 1 + \sqrt{y-2} \rightarrow y = 1 + \sqrt{x-2}$$

$$D_{f^{-1}} = [2, +\infty)$$

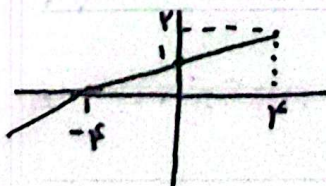
$$y = 2x - \sqrt{1y - (2x + 4x^2)} = 2x - \sqrt{4(x-2)^2} = 2x - 2|x-2| \quad (3)$$

$$y = \begin{cases} 4 & x \geq 2 \\ 4x - 4 & x \leq 2 \end{cases}$$

$$\rightarrow y = 4x - 4, x \leq 2 \rightarrow y \leq 4$$

$$x = \frac{y+4}{4} \rightarrow y = \frac{x+4}{4}$$

$$S = \frac{y+4}{4} = 4 \rightarrow D_{f^{-1}} = (-\infty, 4]$$



$$y = \frac{x}{\sqrt{x^2-5}} \rightarrow y_1 = y_2 \rightarrow \frac{x_1}{\sqrt{x_1^2-5}} = \frac{x_2}{\sqrt{x_2^2-5}} \rightarrow \frac{x_1^2}{x_1^2-5} = \frac{x_2^2}{x_2^2-5} \quad (4)$$

$$\rightarrow x_1^2 x_2^2 - 5x_1^2 = x_1^2 x_2^2 - 5x_2^2 \rightarrow |x_1| = |x_2| \rightarrow x_1 = x_2$$

$$y^2 = \frac{x^2}{x^2-5} \rightarrow x^2 = \frac{5y^2}{y^2-1} \rightarrow |x| = \frac{y\sqrt{5}}{\sqrt{y^2-1}} \rightarrow x = \frac{y\sqrt{5}}{\sqrt{y^2-1}}$$

$$x > 2 \rightarrow x - 2 > 0 \rightarrow (x - 2)^2 > 0 \rightarrow x^2 - 4x + 4 > 0$$

$$\rightarrow x^2 - 4x + 4 > 4 - 4 \quad (1)$$

$$x < 2 \rightarrow \cancel{x - 2 < 0} \rightarrow (x - 2)^2 > 0 \rightarrow x^2 - 4x + 4 > 0$$

$$(x - 2) < -1$$

$$\rightarrow -x^2 + 4x < 1 \rightarrow -x^2 + 4x + 3 < 1 + 3 \quad (2)$$

$$4 - 4 > 3k + 1 \rightarrow 3k \leq -12 \rightarrow k \leq -4 \rightarrow k \in (-\infty, -4]$$

$$x > 2 \text{ و } x < 2$$

$$f(x) = 3x + |x| = \begin{cases} 4x & x \geq 0 \\ 2x & x \leq 0 \end{cases} \rightarrow f^{-1}(x) = \begin{cases} \frac{x}{4} & x \geq 0 \\ \frac{x}{2} & x \leq 0 \end{cases}$$

$$g(x) = a|x| + b \begin{cases} (a+b)x & x \geq 0 \\ (a-b)x & x \leq 0 \end{cases} \rightarrow f^{-1}(x) = g(x) \rightarrow \begin{cases} a+b = \frac{1}{4} \\ a-b = \frac{1}{2} \end{cases}$$

$$\rightarrow a = \frac{3}{8}, b = -\frac{1}{8} \rightarrow ab = -\frac{3}{64}$$

$$f(x) = \frac{3x+4}{x+m} \rightarrow f(2) = \frac{1}{m+2} = -1 \rightarrow m = -3$$

$$f(x) = \frac{3x+4}{x-3} \rightarrow y = \frac{f \circ f^{-1}(x) + f^{-1}(x)}{x}, y = x$$

$$\rightarrow x = x + f^{-1}(x) \rightarrow f^{-1}(x) = 0 \rightarrow x = f(0) = -\frac{4}{3}$$

$$t = g\left(\frac{x}{y}\right) \Rightarrow x = y g^{-1}\left(\frac{t}{y}\right) \rightarrow f(3-2x) = y - t$$

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

$$t = -2 \rightarrow f^{-1}(t) + 4g^{-1}(-2) = 3$$

$$y = \frac{2x-1}{1-x} \rightarrow y = \frac{2x+1}{x+1} \rightarrow y = \frac{2x+1}{x-1}$$

$$f(x) = \frac{2x+6}{x-1} \rightarrow f^{-1}(x) = \frac{x+6}{x-2} \rightarrow f^{-1}(x) = f(x) \rightarrow \frac{2x+6}{x-1} = \frac{x+6}{x-2}$$

$$\frac{2x+6}{x-1} = \frac{x+6}{x-2} \rightarrow \frac{x}{1} = \frac{x+6}{x-2} \rightarrow x^2 - 2x = x+6 \rightarrow x^2 - 3x - 6 = 0$$

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$$f(x) = x + f[x] = y \rightarrow [y] = [x] + f[x] = \omega[x]$$

(1.)

~~$$y = x + f[x] = x + \frac{f}{\omega}[y] \rightarrow x = y - \frac{f}{\omega}[y]$$~~

$$y = x + f[x] = x + \frac{f}{\omega}[y] \rightarrow x = y - \frac{f}{\omega}[y]$$

(2)

$$\begin{aligned} \rightarrow y = x - \frac{f}{\omega}[x] = g(x) &\rightarrow f - g = (x + f[x]) - (x - \frac{f}{\omega}[x]) \\ &= \underline{\underline{\frac{f}{\omega}[x]}} \end{aligned}$$