

1

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0$

$$\frac{(x-1)^2 - x^2}{x(x-1)} = \frac{1-2x}{x(x-1)} \geq 0$$

0	$\frac{1}{2}$	1
+	-	+
+	-	-

$$D_f = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$$

ب) $\frac{1}{x+1} - \frac{2}{x} \rightarrow x \neq 0, -1$

$\frac{3}{x-1} + \frac{1}{x+2} \rightarrow x \neq 1, -2$

$$3x+4+x-1 = 4x+3 \neq 0$$

$$D_f = \mathbb{R} - \left\{-2, -\frac{3}{4}, -1, 0, 1\right\} \quad x \neq -\frac{3}{4}$$

2

الف) $\left(\left(\frac{1}{3}\right)^x - 9\right)(32 - 4^x) \geq 0$

$x = -2$

$x = \frac{\log 32}{\log 4}$

-2	$\frac{\log 32}{\log 4}$
+	-
+	+

$$D_f = (-\infty, -2] \cup \left[\frac{\log 32}{\log 4}, +\infty\right)$$

ب) $\sqrt[4]{x-1} + \sqrt{y+1} = 3 \quad x \geq 1, y \geq -1$

$\sqrt[4]{x-1} \geq 0 \rightarrow x \leq 17$

$$D_f = [1, 17]$$

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

μ

$$x < -1, \quad x > 2 \quad I$$

$$x^2 - 1 > 0 \rightarrow x < -1, \quad x > 1 \quad II$$

$$\Rightarrow I \cap II : D_f = (-\infty, -1) \cup (1, +\infty)$$

$$x = -2 \rightarrow 3 - 2a - 1 = 0 \rightarrow a = \frac{-1}{2}$$

κ

$$-x^2 - \frac{1}{2}x + 3 > 0$$

$$\frac{\frac{1}{2} \pm \frac{\sqrt{13}}{2}}{-1} = -2, \frac{6}{-1} \rightarrow b = \frac{6}{-1} \Rightarrow a+b=1$$

$$3x - 2 > 2 \rightarrow x > 1 \quad \checkmark$$

Δ

$$2x + 3 = 2 \rightarrow x = -\frac{1}{2} \rightarrow (x < 1)$$

$$f(x) = x > 0$$

$$D_f = [-\frac{1}{2}, +\infty)$$

$$\begin{array}{c} -3 \\ -1 \\ + \end{array}$$

$$f\left(\sin \frac{\pi}{2} + \cos 2\pi\right) = f\left(1 + \frac{\sqrt{2}}{2}\right)$$

γ

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

$$\phi\left(\frac{a+1}{a-1}\right) = a$$

V

$$\frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = a \quad \frac{\frac{1+a}{a-1}}{\frac{1-a}{a-1}} = a$$

$$a = 1R - \{1\}$$

$$\phi(\sqrt{a^2-1}) = -f$$

1

$$a^2-1 - f\sqrt{a^2-1} = -f$$

$$(\sqrt{a^2-1} - f)^2 = 0 \rightarrow a = \pm \sqrt{a}$$

9

$$\phi_f = 1 - \Delta + \gamma = \gamma$$

$$\phi_{-f} = 1 - \Delta + \gamma = \gamma$$

$$\phi_f \times \phi_{-f} = \gamma \times \gamma = 1 \text{ if } \gamma$$

10

$$f \cos^2 \alpha + \Delta \cos \alpha - \gamma \Delta = 0$$

$$\Delta = 11 \rightarrow \cos \alpha = \frac{-\Delta \pm \gamma}{1} = \frac{1}{\gamma}, \quad \left(\frac{-\gamma}{f}\right) \rightarrow \cos \alpha = \frac{1}{\gamma}$$

$$\cos \alpha = \frac{1}{\gamma} \rightarrow \tan^2 \alpha = \gamma \Rightarrow \phi_{\gamma \Delta} = \gamma$$