

(الف) $f(x) = \int \frac{x-1}{x} - \frac{x}{x-1} \sim \int \frac{x^2-x+1-x^2}{x(x-1)} = \int \frac{-x+1}{x(x-1)}$

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

(ب) $f(x) = \frac{1}{x+1} - \frac{1}{x+2}$ $x \neq -1, -2, 0, 1$

$$\frac{1}{x+1} + \frac{1}{x+2} \neq 0 \quad \frac{1}{x-1} + \frac{1}{x-2} \neq 0 \quad \frac{1}{x+1} + \frac{1}{x-1} \neq 0 \quad \frac{1}{x+2} + \frac{1}{x-2} \neq 0$$

(الف) $f(x) = \int \left(\left(\frac{1}{x} \right)^x - 9 \right) (15 - x^x) \geq 0$ $x = -2$ $x = \frac{0}{e}$ $x = \frac{0}{e}$

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

(ب) $\sqrt{x-1} + \sqrt{y+1} = 10$ $x \geq 1$ $y \geq -1$ $D_f = [1, 15]$

$$\sqrt{y+1} = 10 - \sqrt{x-1} \geq 0 \quad 11 \geq x-1 \quad x \leq 12$$

$f(x) = \frac{\log(x^2 - x - 5)}{\sqrt{x^2 - 1} + 1} \geq 0$ $(x-5)(x+1) \geq 0$ $D_f = (-\infty, -1) \cup (5, +\infty)$

$$x \geq 1 \quad x \neq -1 \quad \cap \quad (-\infty, -1) \cup (5, +\infty)$$

$f(x) = \sqrt{x^2 + ax - x^2} \geq 0$ $D_f = [-r, b]$ $x^2 - 1a - x^2 = 0$ $x^2 - \frac{1}{r}x - x^2$

$$-1(x+2)(x+2) \times \quad a = -1 \quad a = -\frac{1}{r}$$

$$-1(x+2)(x-\frac{1}{r}) \quad x^2 - \frac{1}{r}x - b^2 = 0$$

$$-x^2 - \frac{1}{r}x + \frac{1}{r^2}$$

$$r \times 1b^2 + b - 9 = 0$$

$$8b^2 + 5b - 17 = 0$$

$$(1b+8)(1b-17)$$

$$b = \frac{-5}{8} \quad \frac{17}{8}$$

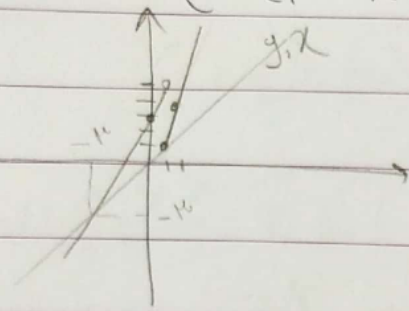
$$a+b = -\frac{1}{r} + \frac{1}{r} = 1$$

$$f(x) = \begin{cases} x^2 - 1 & x \geq 1 \\ x^2 + 1 & x < 1 \end{cases}$$

$$g(x) = \begin{cases} f(x) & x \geq 0 \\ f(x) \geq x \end{cases}$$

$$-1 \leq x$$

$$D_f = [-1, +\infty)$$



$$f(x) = x^2 - 1$$

$$f(\sin \pi + \cos \pi)$$

$$f\left(\frac{\sqrt{17}}{1} + 1\right) = 1\left(\frac{\sqrt{17}}{1} + 1\right)^2 - 1\left(\frac{\sqrt{17}}{1} + 1\right)$$

$$1\left(\frac{17}{1} + 1 + \sqrt{17}\right) - 1\sqrt{17} - 1 = \left[-\frac{1}{1}\right]$$

$$f(x) = \frac{x+1}{x-1}$$

$$f(f(a)) = a$$

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

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

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

$$\frac{2}{a-1}$$

$$R = \{1, 2\}$$

$$f(x) = x^2 - 1$$

$$g(x) = \begin{cases} x^2 - 1 & x \geq 1 \\ x^2 + 1 & x < 1 \end{cases}$$

$$x^2 - 1 \geq -1$$

$$x^2 - 1 \geq -1$$

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

$$x \geq 1$$

$$a^2 - 1 \geq -1$$

$$a^2 \geq 0$$

$$a = \pm \sqrt{0}$$

$$f(x+1) = x^2 - 1$$

$$f(x) \times f(-1) = 1 \times 1 = 1$$

$$x+1 \geq 1 \rightarrow x \geq 0$$

$$x+1 \geq -1 \rightarrow x \geq -2$$

Subject:

Date:

$$f(r \cos^2 \alpha + a \cos \alpha) = \tan^2 \alpha$$

$$f\left(\frac{r}{r}\right) = \tan^2 \alpha = \boxed{10}$$

10)

$$r \cos^2 \alpha + a \cos \alpha = \frac{V}{r}$$

$$r \cos^2 \alpha + a \cos \alpha - \frac{V}{r} = 0$$

$$\cos^2 \alpha + a \cos \alpha - \frac{V}{r} = 0$$

$$(\cos \alpha + V)(\cos \alpha - 1) = 0$$

$$\cos \alpha = -\frac{V}{r} \quad \cos \alpha = \frac{r}{r} = 1 \quad \checkmark$$

$$\cos \alpha = \frac{1}{r}$$

$$= -\frac{1}{r} \times \frac{10}{r} = -\frac{10}{r^2}$$

$$\alpha = 90^\circ$$