

$$1) \quad x^r - \Delta x + \gamma > 0$$

$$\underbrace{(x-r)}_1 \underbrace{(x-r)}_r > 0$$

$$+ \frac{r}{r} - \frac{r}{r} +$$

$$Df = (-\infty, r) \cup (r, +\infty)$$

$$x^r - \gamma x + \Delta < 0$$

$$\underbrace{(x-\Delta)}_0 \underbrace{(x-1)}_1 < 0$$

$$+ \frac{1}{r} - \frac{\Delta}{r} +$$

$$Df = (1, \Delta)$$

$$) \quad x^r + \gamma x + \Delta \geq 0$$

$$\underbrace{(x+1)}_{-1} \underbrace{(x+\Delta)}_{-\Delta} \geq 0$$

$$+ \frac{-\Delta}{r} - \frac{-1}{r} +$$

$$Df = [-\infty, -\Delta] \cup [-1, +\infty)$$

$$2) \quad x^r - \gamma x + \gamma < 0$$

$$\underbrace{(x-r)}_r \underbrace{(x-1)}_1 < 0$$

$$+ \frac{r}{r} - \frac{r}{r} +$$

$$Df = [1, r]$$

$$) \quad \frac{x^r - \gamma x + r}{x - \Delta} < 0$$

$$\underbrace{(x-r)}_r \underbrace{(x-1)}_1 \frac{1}{x-\Delta} < 0$$

$$- \frac{1}{r} + \frac{r}{r} - \frac{\Delta}{r} +$$

$$-\Delta$$

$$Df = (-\infty, 1) \cup (r, \Delta)$$

$$-1) \quad \frac{x^r - 1}{x^r - \gamma x + \Delta} \geq 0$$

$$\underbrace{(x+1)}_{-1} \underbrace{(x-1)}_1 \frac{1}{(x-\Delta)(x-1)} \geq 0$$

$$+ \frac{-1}{r} - \frac{1}{r} - \frac{\Delta}{r} +$$

$$2) \quad y = \sqrt{\frac{x^r - \gamma x + r}{x^r - 1}}$$

$$\frac{x^r - \gamma x + r}{x^r - 1} \geq 0$$

$$\underbrace{(x-r)}_r \underbrace{(x-1)}_1 \frac{1}{x^r - 1} \geq 0$$

$$Df = (-\infty, -1] \cup (\Delta, +\infty)$$

$$3) \quad y = \sqrt{\frac{x^r - \gamma x + r}{x^r - 1}}$$

$$x^r - 1 \neq 0$$

$$x^r \neq 1$$

$$x \neq \pm 1$$

$$- \frac{1}{r} + \frac{r}{r} - \frac{\Delta}{r} +$$

$$Df = [r, +\infty)$$

$$4) \quad y = \log(x^r - \gamma x)$$

$$x^r - \gamma x > 0$$

$$\underbrace{(x-r)}_r \underbrace{(x-1)}_1 > 0$$

$$+ \frac{r}{r} - \frac{r}{r} +$$

$$-1$$

$$5) \quad y = \log \frac{1-r}{1-x-r}$$

$$1-r > 0$$

$$|x| - r > 0$$

$$x > r$$

$$- \frac{r}{r} + \frac{r}{r} -$$

$$Df = (-\infty, 0) \cup (r, +\infty)$$

$$-x < -r \cap I$$

$$\left\{ \begin{array}{l} |x| - r \neq 1 \\ |x| \neq r \\ x \neq \pm r \end{array} \right.$$

$$Df = (-\infty, -r) \cup (r, r) - \{ -r, r \}$$

$$y = \log \frac{x^2 - \sqrt{x^2 + 1}}{1 - x}$$

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

$$(x - 1)(x - 1) > 0$$

$$\frac{x - 1}{x - 1} > 0$$

$$(x + \infty) \cap$$

$$1 - x > 0$$

$$1 - x \neq 1 \quad x \neq 0$$

$$D_f = (0, 1) \cup (1, \infty)$$

$$y = \sqrt{x^2 - 1} \log x$$

$$x^2 - 1 \geq 0 \Rightarrow x \geq 1$$

$$\frac{1}{x - 1} > 0$$

$$(-\infty, 1) \cup (1, \infty) \cap$$

$$x^2 - 1 > 0$$

$$-1 < x < 1$$

$$x > 1$$

$$D_f = (0, 1) \cup (1, \infty)$$

$$= \frac{x^2 - x}{x^2 + x}$$

$$\frac{1}{x(x+1)}$$

	-	+	0	-	+
$x^2 - x$	+	+	-	-	+
$x^2 + x$	+	-	+	+	-
$D(x)$	+	+	-	-	+

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

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$$y = \sqrt{\frac{x - f(x)}{f(x)}}$$

-9

$$x - f(x) = 0$$

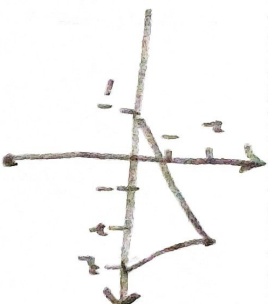
$$x = f(x) \Rightarrow x = -1$$

$$f(x) = 0 \Rightarrow x = -1$$

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

$$D_f = (-\infty, -1) \cup (-1, 1) \cup (1, \infty)$$

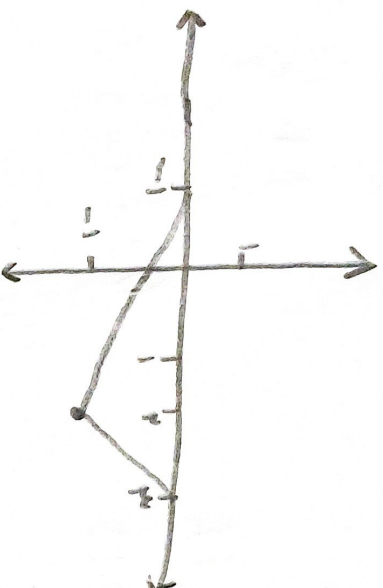
$$f(x) + 1$$



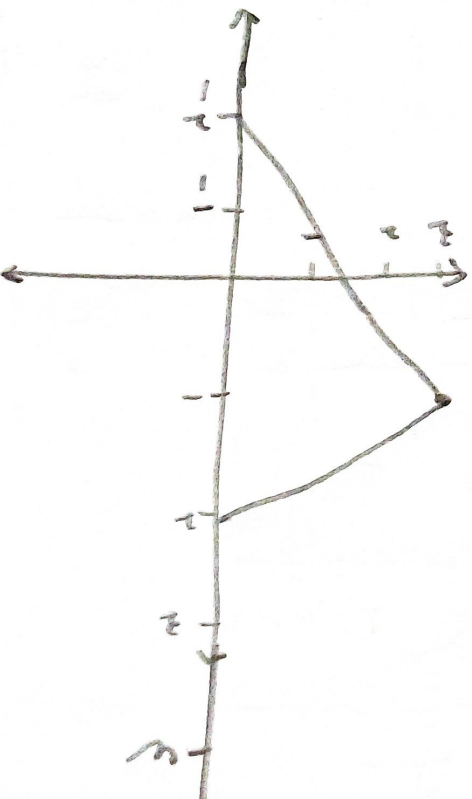
$$f(x-1)$$



$$f(x) - f(x)$$



$$f(x+1) + 1$$



$$الف) y = \frac{x+3}{x^3 - 2x^2 + 3x - 1}$$

مع ضابط = 0 من اجل x-1

$$D_f = \mathbb{R} - \left\{ 1, \frac{3}{2}, \frac{5}{2} \right\}$$

$$ب) y = \frac{x+3}{x^3 - x^2 - 1x - 4}$$

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

$$D_f = \mathbb{R} - \left\{ -1, 2, -\frac{1}{2} \right\}$$

$$(x^2 - 4x - 4) = (x-2)(x+2)$$

$$الف) y = \frac{x+1}{x - \sqrt{3-2x}}$$

$$3-2x \geq 0$$

$$x \leq \frac{3}{2}$$

$$x \leq \frac{3}{2} \quad I$$

$$x - \sqrt{3-2x} \neq 0$$

$$x \neq \sqrt{3-2x}$$

$$x^2 \neq 3-2x$$

$$x^2 + 2x - 3 \neq 0$$

$$(x+3)(x-1) \neq 0$$

$$x \neq -1, 1$$

$$D_f = (-\infty, \frac{3}{2}] - \left\{ 1, -1 \right\}$$

$$ب) y = \frac{x+2}{x - \sqrt{3x-2}}$$

$$3x-2 \geq 0$$

$$x \geq \frac{2}{3}$$

$$x \geq \frac{2}{3} \quad I$$

$$x - \sqrt{3x-2} \neq 0$$

$$x \neq \sqrt{3x-2}$$

$$x^2 \neq 3x-2$$

$$x^2 - 3x + 2 \neq 0$$

$$(x-2)(x-1) \neq 0$$

$$x \neq 2, 1 \quad II$$

$$D_f = \left[\frac{2}{3}, +\infty \right) - \left\{ 1, 2 \right\}$$

$$الف) y = \frac{\sin x}{2(\cos x - 1)}$$

$$2(\cos x - 1) \neq 0$$

$$2 \cos x \neq 1$$

$$\cos x \neq \frac{1}{2}$$

$$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right\}$$

$$ب) y = \frac{\cos x + 1}{2 \sin x + 1}$$

$$2 \sin x + 1 \neq 0$$

$$2 \sin x \neq -1$$

$$\sin x \neq -\frac{1}{2}$$

$$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6} \right\}$$

$$ج) y = \frac{\tan x + 2}{\cot x - 1}$$

$$\tan x = \frac{\sin x}{\cos x}$$

$$\cos x \neq 0 \quad I$$

$$(\cot x - 1) \neq 0 \quad \cot x \neq 1$$

$$\cot x = \frac{\cos x}{\sin x} \rightarrow \sin x \neq 0$$



$$D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4} \right\}$$

$$د) y = \frac{\sin x + 1}{\sin^2 x - 3}$$

$$\sin^2 x - 3 \neq 0$$

$$\sin^2 x \neq 3$$

$$\sin^2 x \neq \frac{3}{1}$$

$$\sin x \neq \pm \sqrt{3}$$

$$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$$

