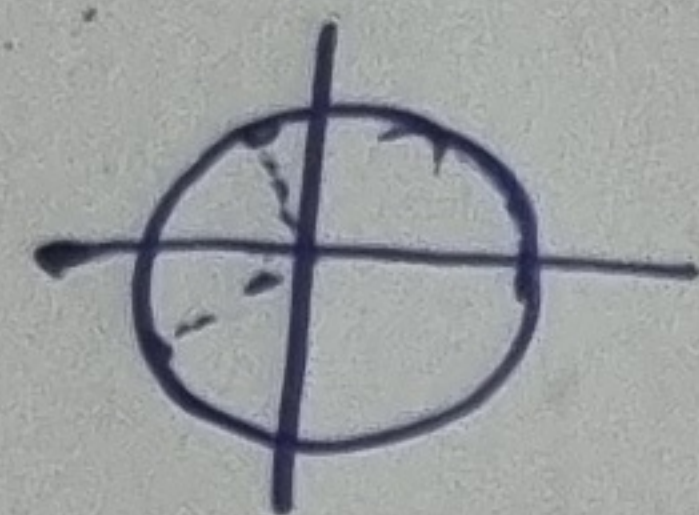


الف، $y = \frac{\sin x - 2}{2\cos x + 1}$

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

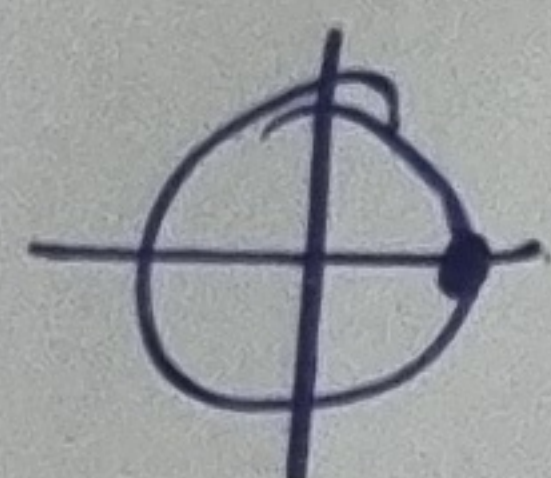


$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right\}$

1

ب، $y = \frac{\sin x + 3}{\cos x - 1}$

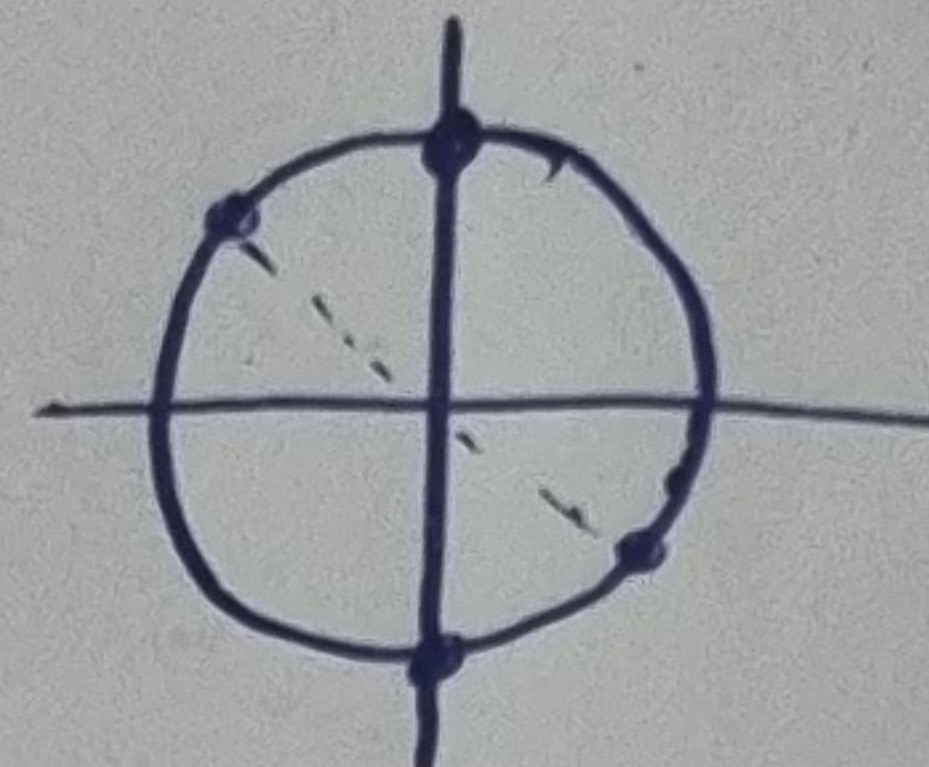
$\cos x - 1 \neq 0 \rightarrow \cos x \neq 1$



$D_f = \mathbb{R} - \{2k\pi\}$

الف، $y = \frac{2\sin x + 1}{\tan x + 1}$

$\begin{cases} \tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \\ \cos x \neq 0 \rightarrow k\pi + \frac{\pi}{2} \end{cases}$

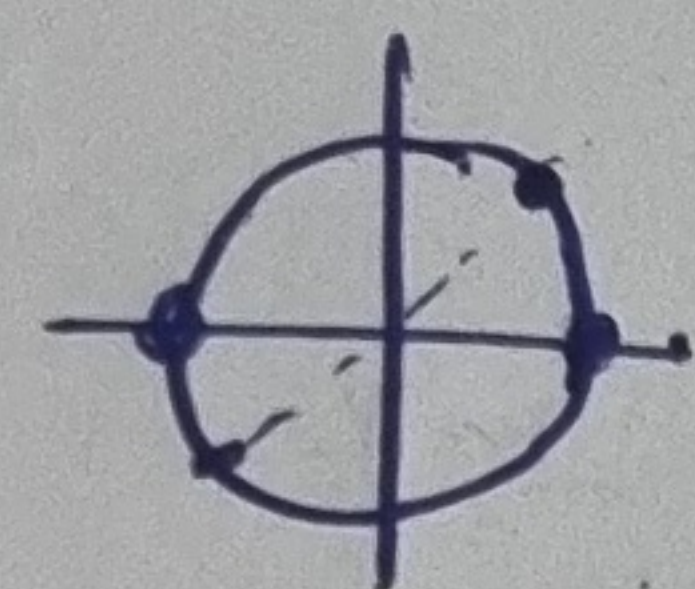


$D_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right\}$

2

ب، $y = \frac{\cos x + 1}{\cot x - 1}$

$\begin{cases} \cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \\ \sin x \neq 0 \rightarrow k\pi \end{cases}$



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

الف، $\sin y = x^2 - 2$

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

$-\sqrt{3} \leq x \leq \sqrt{3}$

$1 \leq x^2 \leq 3$

$-\sqrt{3} \leq x \leq \sqrt{3}$

$D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

$-1 \leq \sqrt{x} - 2 \leq 1$

$1 \leq x \leq 16$

ب، $y = \arccos(\sqrt{x} - 2)$

$2 \leq \sqrt{x} \leq 4$

$D_f = [4, 16]$

3

الف، $\cos y = |x| - 3$

$-1 \leq |x| - 3 \leq 1$

1, $-4 \leq x \leq 4$

2, $x \geq 2$
 $x \leq -2$

$D_f = [-4, -2] \cup [2, 4]$

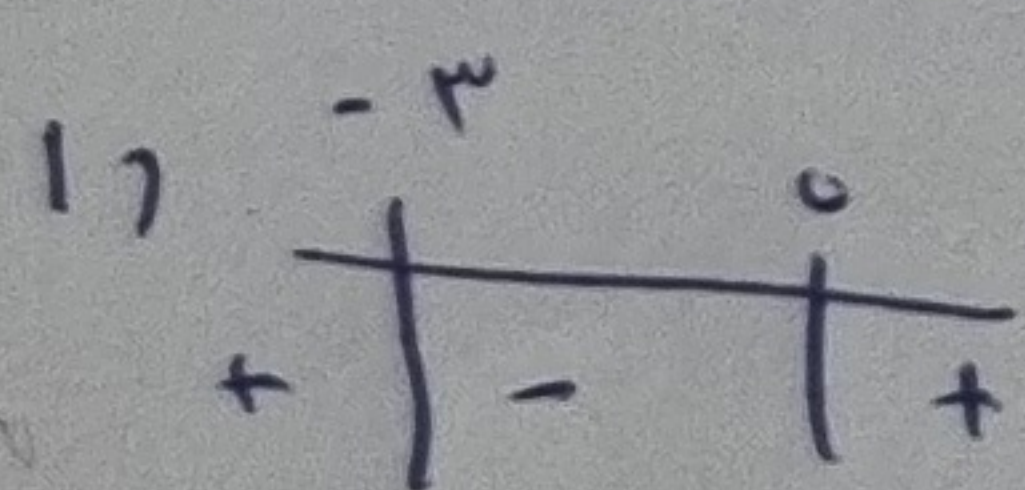
$2 \leq |x| \leq 4$

4

ب، $y = \arcsin(x^2 + 3x + 1)$

$D_f = [-3, -2] \cup [-1, 0]$

$-1 \leq x^2 + 3x + 1 \leq 1$



$\begin{cases} 1) x^2 - 2x + 1 \leq 1 \rightarrow x^2 - 2x \leq 0 \rightarrow x(x-2) \leq 0 \rightarrow 0 \leq x \leq 2 \\ 2) x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0 \rightarrow x \leq -2 \text{ or } x \geq -1 \end{cases}$

الف، $y = \log_3 x^2 - 4$

$x^2 - 4 > 0$
 $x^2 > 4$

$-2 > x > 2$

$D_f = (-\infty, -2) \cup (2, \infty)$

5

ب، $y = \log_2 \sqrt{1-x}$

$1 - |x| > 0$

$1 > |x|$

$D_f = (-1, 1)$

$-1 < x < 1$

$$الف = \log \frac{\omega - x}{x - 2}$$

$$\omega - x > 0$$

$$\omega > x$$

$$x - 2 > 0$$

$$x > 2$$

$$x - 2 \neq 1$$

$$x \neq 3$$

$$D_f = (2, \omega) - \{3\}$$

6

$$ب = \log \frac{x^2 - 1}{x + 2}$$

$$x^2 - 1 > 0$$

$$x^2 > 1$$

$$x + 2 > 0$$

$$x > -2$$

$$D_f = (-2, -1) \cup (1, +\infty) -$$

$$-1 > x > 1$$

$$x + 2 \neq 1$$

$$x \neq -1$$

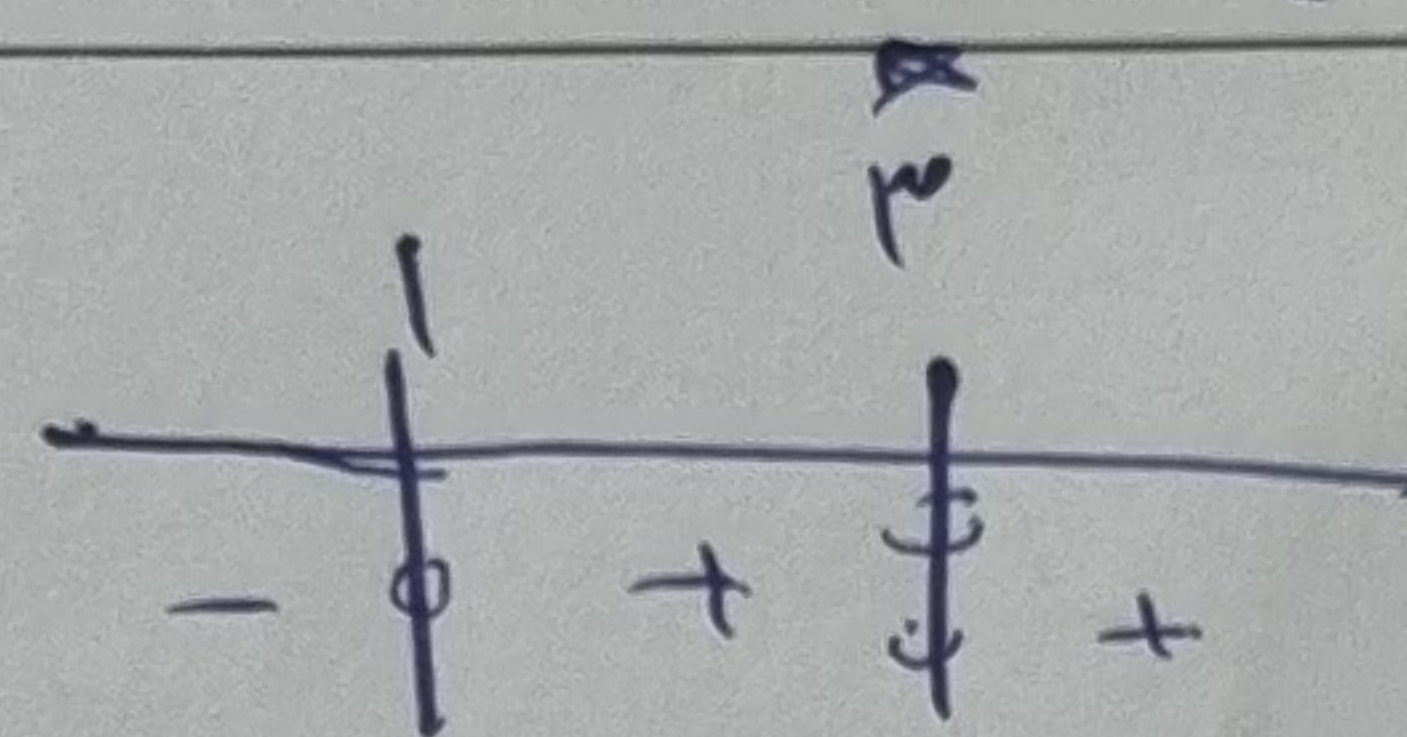
$$\{-1\}$$

$$الف = \gamma = \log \frac{x^2 - f x + 3}{x - 2}$$

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

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

$$\frac{(x - 1)(x - 3)}{(x - 2)} > 0$$



7

$$ب, \gamma = \log \frac{x + 3}{x - 2}$$

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

$$x > -3$$

$$x > 2$$

$$D_f = (-\infty, -3) \cup (2, +\infty) - \{2\}$$

$$x + 3 > 0$$

$$x > -3$$

$$x + 2 \neq 1$$

$$x \neq -1$$

$$الف = \gamma = \sqrt{3 - \log_r(x - 2)}$$

$$x - 2 > 0$$

$$x > 2$$

$$3 - \log_r(x - 2) \geq 0$$

$$3 \geq \log_r(x - 2)$$

$$D_f = (2, 10]$$

$$r^3 \geq x - 2$$

$$\wedge \geq x - 2$$

$$10 \geq x$$

8

$$ب, \gamma = \log(2 \log_r x - 1)$$

$$2 \log_r x - 1 > 0$$

$$x > r^{\frac{1}{2}}$$

$$2 \log_r x > 1$$

$$x > \sqrt{r}$$

$$\log_r x > \frac{1}{2}$$

$$D_f = (\sqrt{r}, +\infty)$$

$$الف \gamma = \frac{r}{e^x + 1}$$

$$e^x + 1 \neq 0$$

$$D_f = \mathbb{R}$$

$$e^x \neq -1 \rightarrow \text{مستحيل}$$

$$ب, \gamma = \frac{r}{e^x - 1}$$

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

$$e^x \neq 1$$

$$x \neq 0 \quad D_f = \mathbb{R} - \{0\}$$

$$ج, \gamma = \frac{r}{e^x - 2}$$

$$e^x - 2 \neq 0$$

$$e^x \neq 2$$

$$x \neq \frac{1}{r} \quad D_f = \mathbb{R} - \{\frac{1}{r}\} \subseteq \mathbb{R} - \{\log_r 2\}$$

$$د, \gamma = \frac{r}{e^x - 3}$$

$$e^x - 3 \neq 0$$

$$e^x \neq 3$$

$$D_f = \mathbb{R} - \{\log_r 3\}$$

9

$$الف, \gamma = (e^x + 1)!$$

$$e^x + 1 \in \mathbb{N}$$

$$e^x \in \mathbb{N} - 1$$

$$x \in \frac{\mathbb{N} - 1}{f}$$

$$D_f = \{x \mid x = \frac{k-1}{f}, k \in \mathbb{N}\}$$

10

$$ب, \gamma = \left(\frac{r x - 2}{r x - \omega} \right)!$$

$$\frac{r x - 2}{r x - \omega} \in \mathbb{N}$$

$$x = \frac{-\omega k - 2}{rk - r}$$

$$D_f = \{x \mid x = \frac{-\omega k - 2}{rk - r}, k \in \mathbb{N}\}$$

$$\frac{ax + b}{cx + d} = \gamma = x \Rightarrow \frac{dy - b}{cy - a}$$