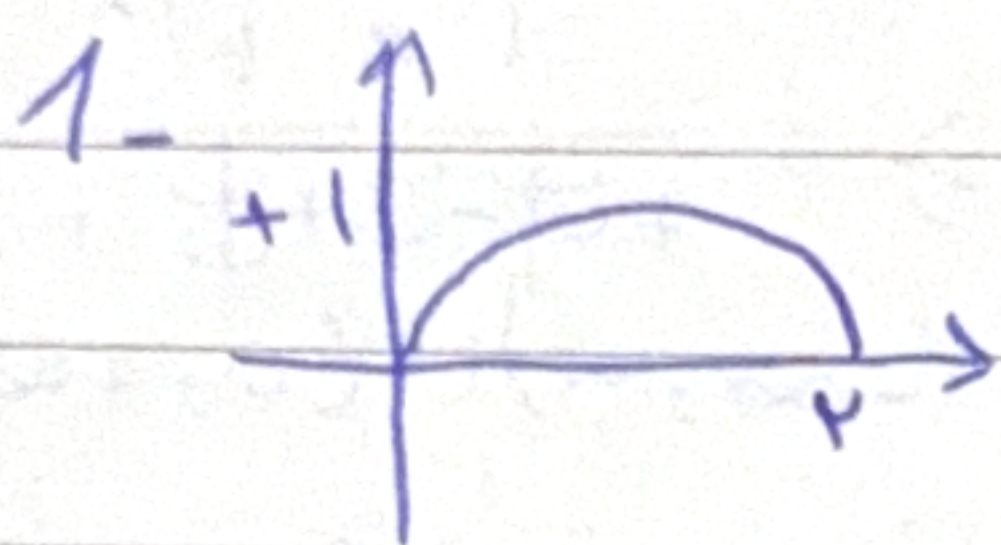
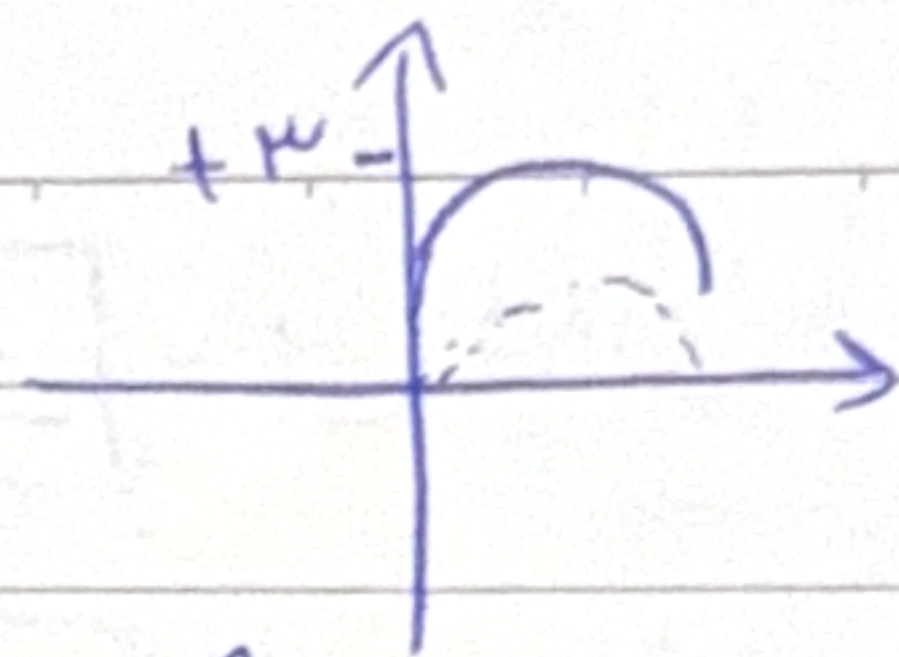


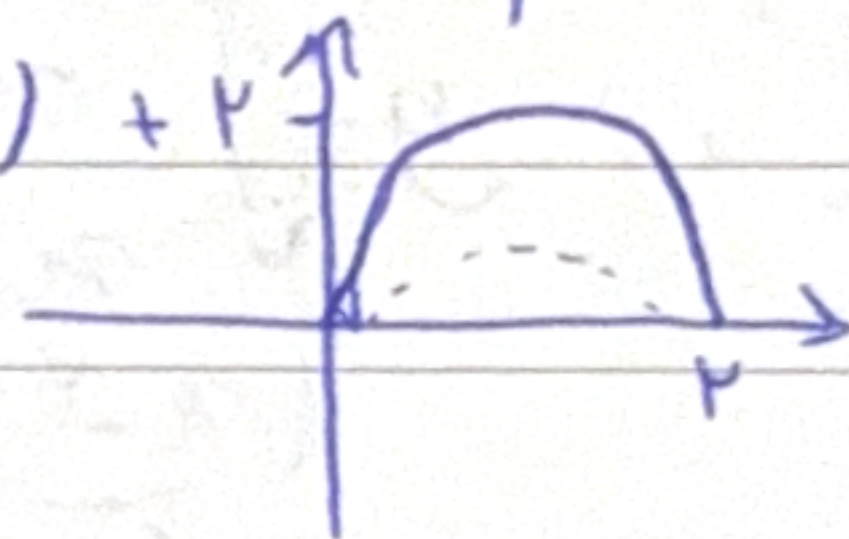
سایه زایی



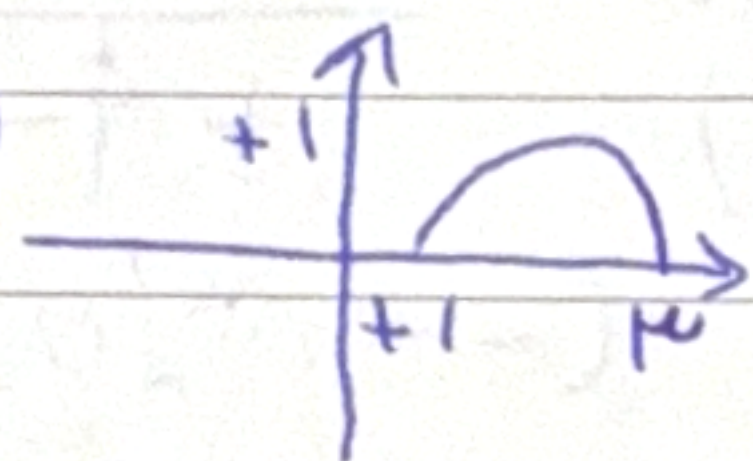
الف) $f(x+2)$



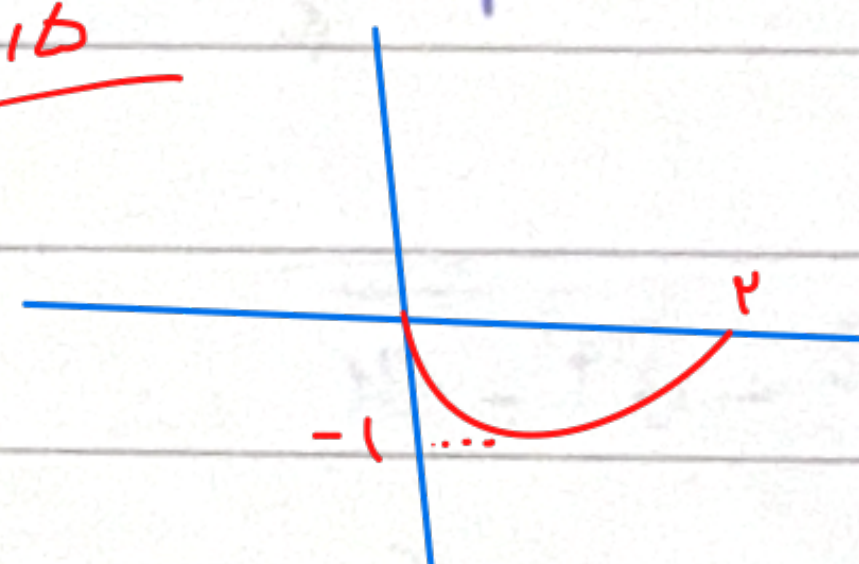
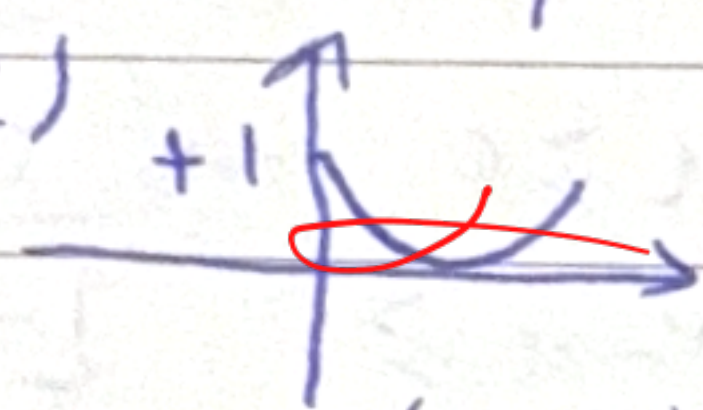
ب) $2f(x) + 2$



ج) $f(x-1)$

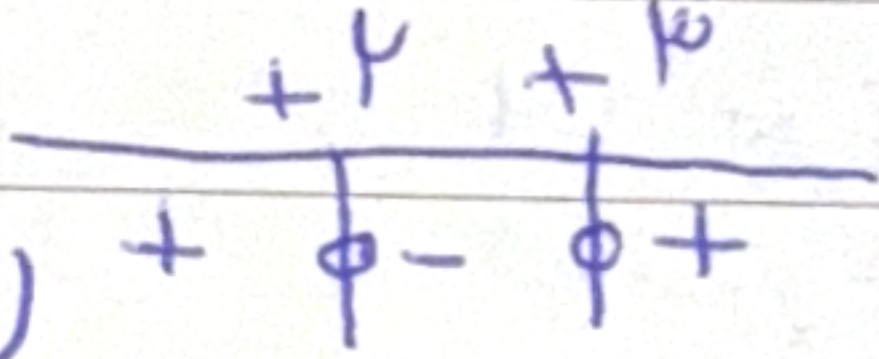


د) $-f(x)$



2- الف) $x^2 - 2x + 4 > 0$

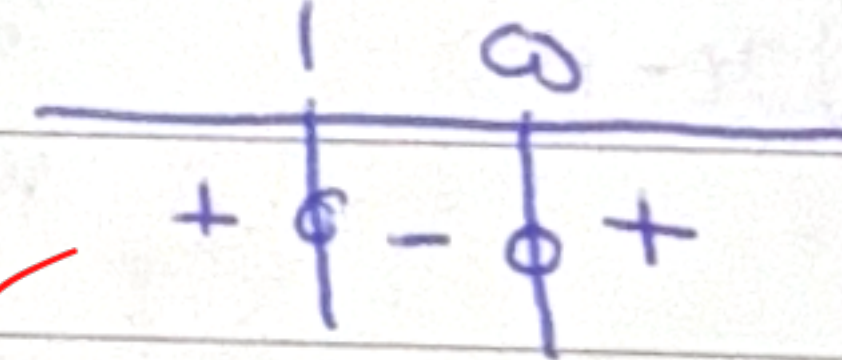
$(-\infty, +\infty) \cup (-\infty, 2)$



ب) $x^2 - 4x + 5 < 0$

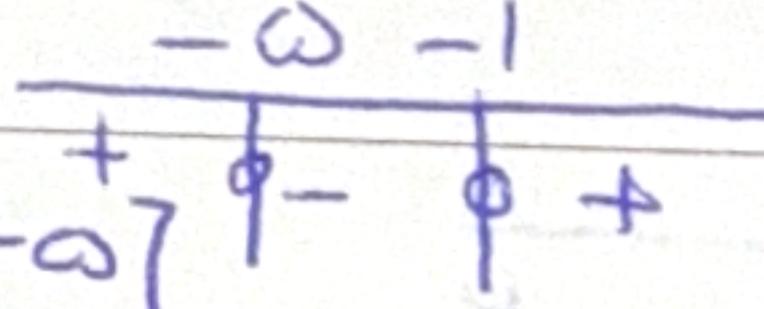
$(1, 5)$

✓



ج) $x^2 + 4x + 5 \geq 0$

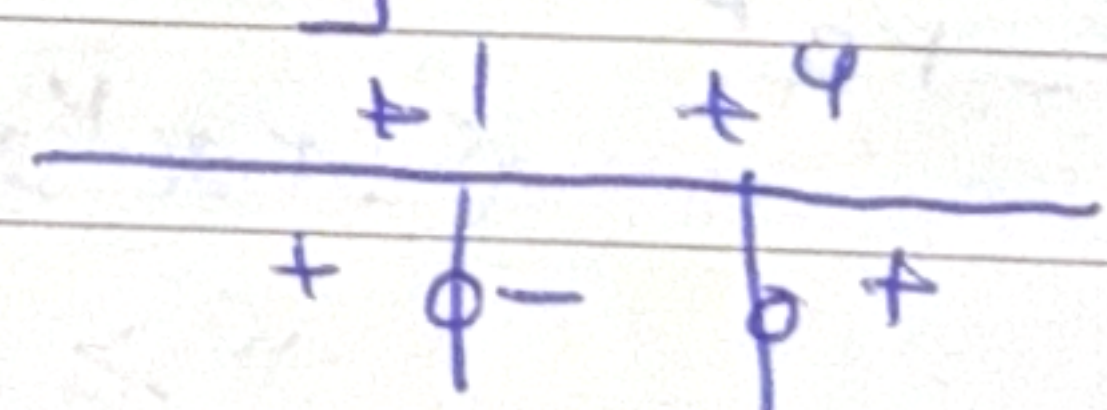
$[-1, +\infty) \cup (-\infty, -5]$



د) $x^2 - 7x + 4 \leq 0$

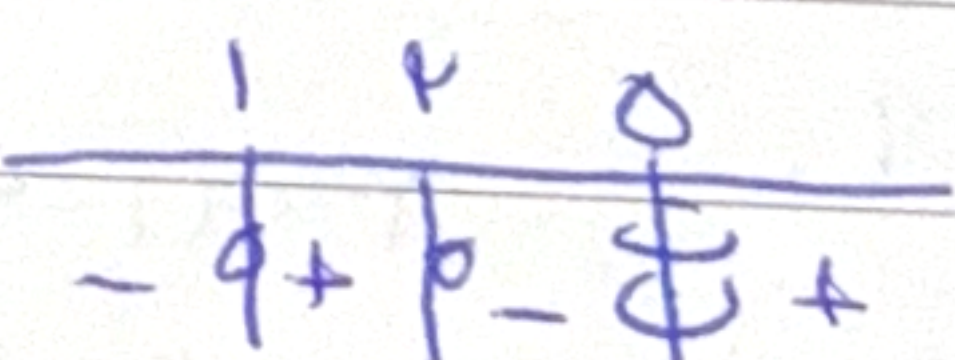
$(x-1)(x-4)$

$[1, 4]$



3-

$\frac{x^2 - 2x + 2}{x - 5} < 0$

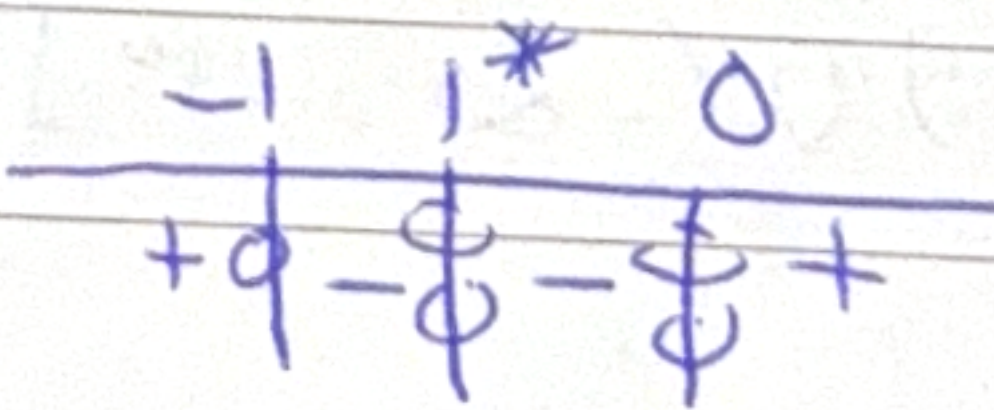


1, 2

$(-\infty, 1) \cup (2, 5)$

✓

$x^2 - 1 \geq 0$



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

$x^2 + 2x + 5$

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

$(-\infty, -1]$

4- الف) $y = \sqrt{\frac{x^3-1}{x^3-x}}$ $\frac{x^3-1}{x^3-x} \geq 0$ $\frac{x^3-1}{x(x^2-1)} \geq 0$ $\frac{-1 \ 0 \ +1}{+ \ - \ + \ +}$
 $(-\infty, -1) \cup (0, +\infty) - \{1\}$

ب) $y = \sqrt{\frac{x^2-14}{x^2-5x+6}}$ $\frac{x^2-14}{(x-3)(x-2)} \geq 0$ $\frac{- \ + \ +}{+ \ - \ + \ +}$
 $(-\infty, -3] \cup (1, +\infty) - \{2\}$

5- $\sqrt{x} - \sqrt{x-2}$

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

$x-2 \leq 14$

$-14 \leq x$

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

$x-2 \geq 0$

$x - \sqrt{x-2} \geq 0$

$x \geq \sqrt{x-2}$

$-14 \leq x$

$14 \geq x-2$

$x-2 \geq 0$

$x - \sqrt{x-2} \geq 0$

$x \geq \sqrt{x-2}$

$9 \geq x-2$

$D_f \rightarrow [2, 11]$

$11 \geq x$

6- $\sqrt{x-2x^2}$

$x-2x^2 \geq 0$

$x \geq 2x^2$

$D_f \rightarrow \sqrt{-2x^2}$

$\sqrt{x} \geq x \geq \sqrt{x}$

$\sqrt{x|x|-9}$

$x|x|-9 \geq 0$

$x|x| \geq 9$

$|x| \geq 3$

$[3, +\infty) \cup (-\infty, -3]$

$x \geq 3 \quad -3 \geq x$

$$7 - \sqrt[3]{\frac{|x|+1}{|x|-1}}$$

$$\mathbb{R} - \{ \mp 1 \}$$

$$\sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-1}}$$

$$x \geq 0$$

$$\sqrt{x} \neq 1$$

$$x \neq 1$$

Ⓢ ✓

$$\mathbb{R}^+_{\neq \{0\}} - \{1\}$$

$$[0, +\infty) - \{1\}$$

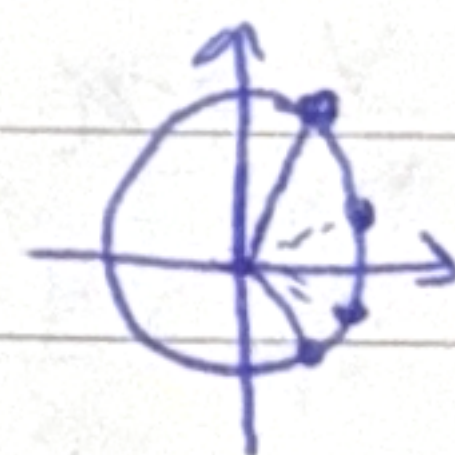
$$8 - \frac{\sin x}{y \cos x - 1}$$

$$\mathbb{R} - \left\{ yk\pi \pm \frac{\pi}{4} \right\}$$

$$\frac{\cos x + 1}{y \sin x + 1}$$

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

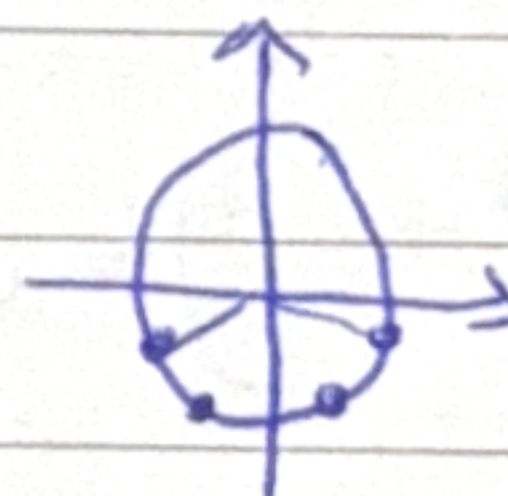
$$\cos x \neq \frac{1}{y}$$



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

$$\mathbb{R} - \left\{ yk\pi - \frac{\pi}{4}, yk\pi + \frac{\pi}{4} \right\}$$

$$\sin x = -\frac{1}{y}$$

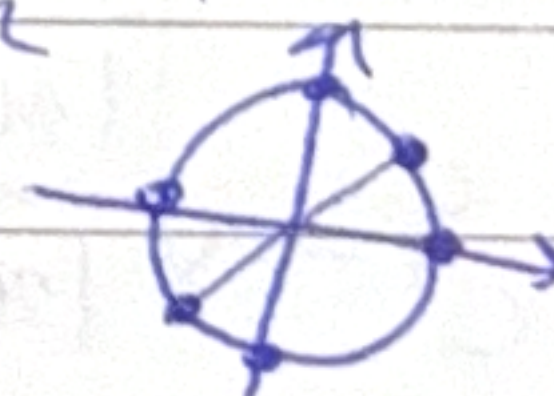


$$\frac{\tan x + y}{\sec x - 1}$$

$$\frac{\frac{\sin x}{\cos x} + y}{\frac{1}{\cos x} - 1}$$

$$\cos x \sin x \neq 0$$

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



$$\mathbb{R} - \left\{ \frac{k\pi}{y}, k\pi + \frac{\pi}{y} \right\}$$

$$\frac{\sin x + 1}{y \sin^2 x - 1}$$

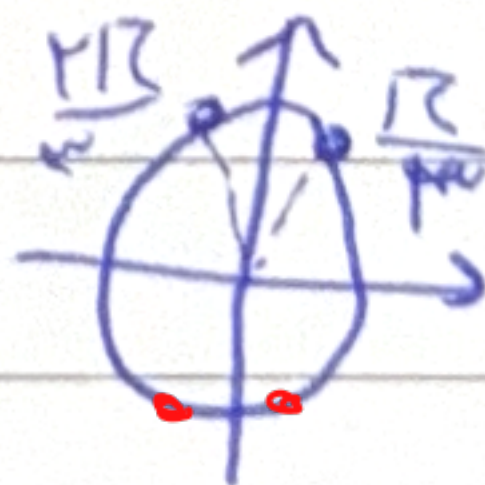
$$y \sin^2 x - 1 \neq 0$$

$$\sin x = \pm \sqrt{\frac{1}{y}}$$

1, \sqrt{2}

$$\mathbb{R} - \left\{ yk\pi + \frac{\pi}{y}, yk\pi + \frac{\pi}{y} \right\}$$

$$k\pi \pm \frac{\pi}{y}$$



$$9 - y = \frac{1}{\sqrt{r|x-r| - \frac{1}{r}}}$$

$$D_f = (-\infty, \frac{r}{k}) \cup (\frac{r}{k}, +\infty)$$

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

$$r|x-r| > \frac{1}{r}$$

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

Ⓟ ✓

$$\frac{r}{k} > x$$

$$x > \frac{r}{k}$$

$$-\frac{1}{k} > x - r > \frac{1}{k}$$

$$\frac{r}{k} > x > \frac{r}{k}$$

$$10 - y = \sqrt{k - r|x|}$$

$$k - r|x| \geq 0$$

$$D_f = [-r, r]$$

Ⓟ ✓

$$k \geq r|x|$$

$$r \geq |x|$$

$$r \geq x \geq -r$$

$$y = \sqrt{\frac{|x|}{|x|}}$$

$$\mathbb{R} - \{0\}$$