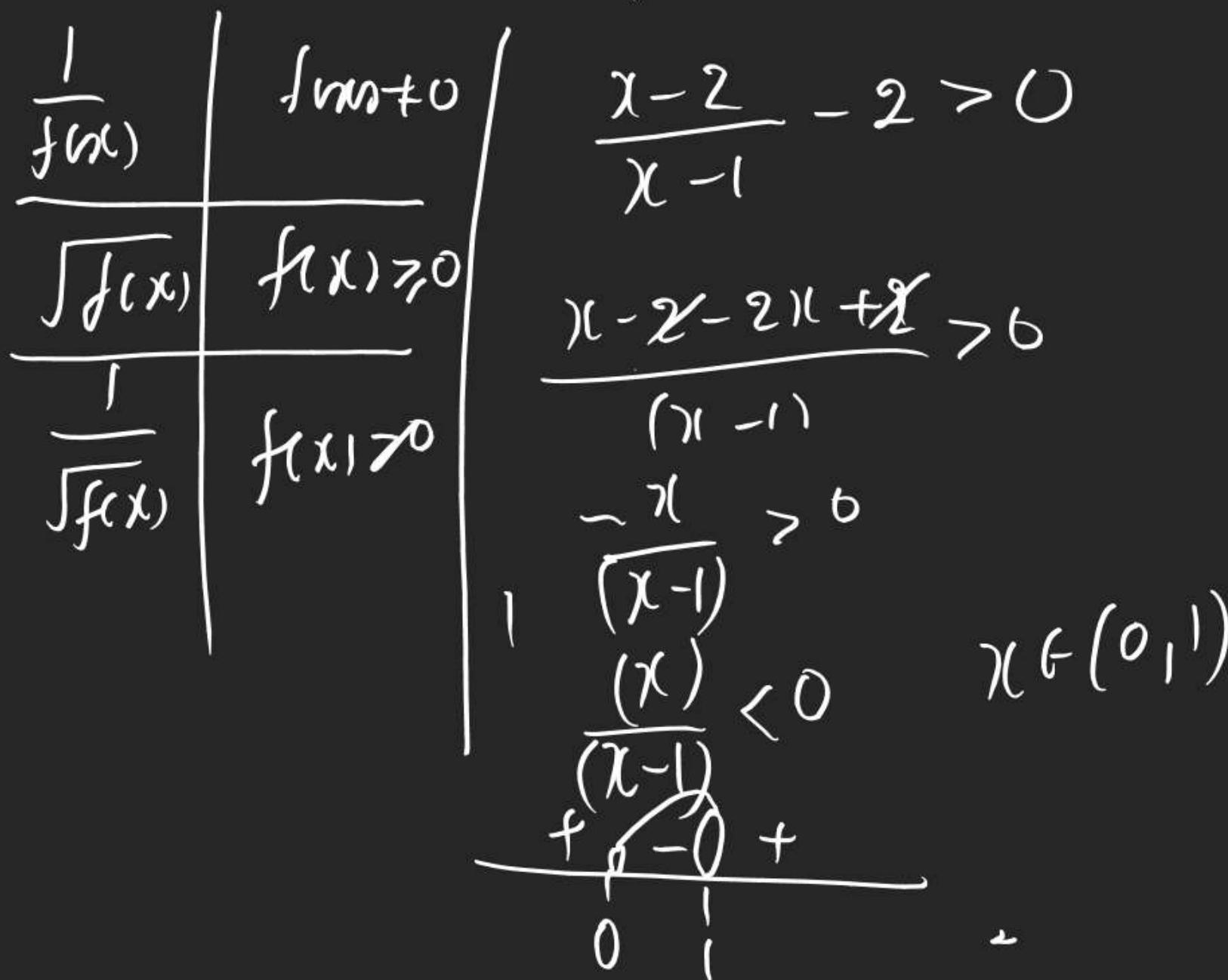


RELATION FUNCTION

Domain Q

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



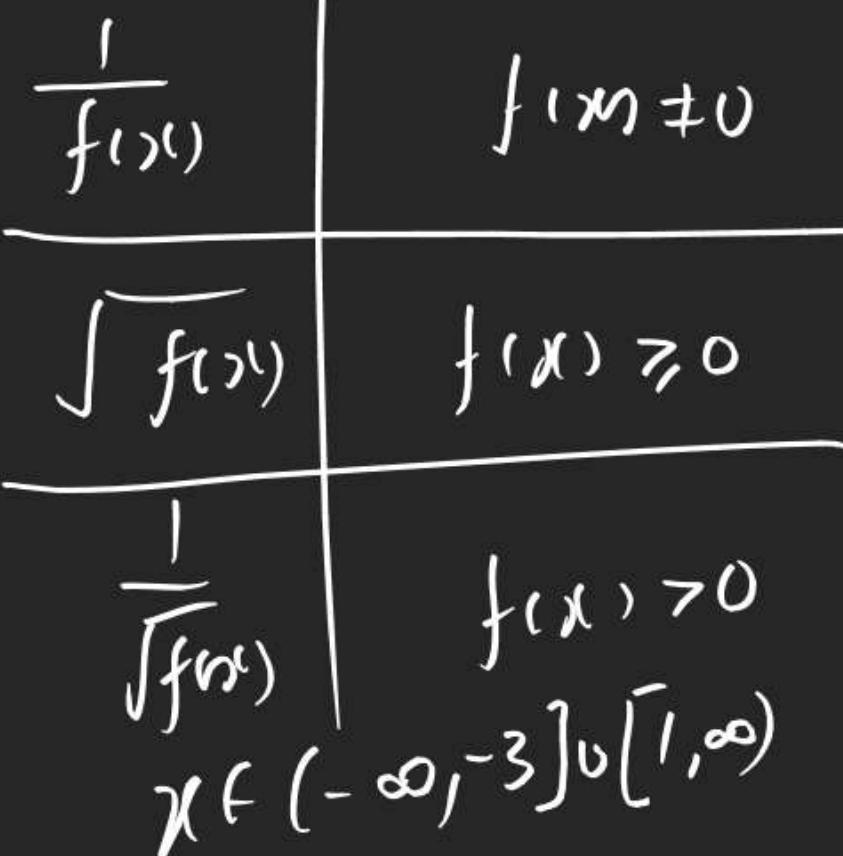
If $f(x) = \frac{x-2}{x-1} - 2$ find Dm?

$$\frac{x-2}{x-1} - 2 \geq 0$$

RELATION FUNCTION

Domain (\mathbb{R}^m)

Type



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

find Dom

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

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

$$x \neq -1, -3$$

$$x \in (-\infty, \infty) - \{-3, 1\}$$

$$2) y = \sqrt{x^2 + 2x - 3} \rightarrow \sqrt{f(x)}$$

find Dom

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

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

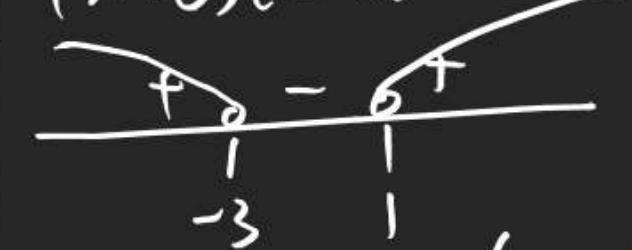


$$3) y = \frac{1}{\sqrt{x^2 + 2x - 3}}$$

find Dom?

$$x^2 + 2x - 3 > 0$$

$$(x+3)(x-1) > 0$$



$$x \in (-\infty, -3) \cup (1, \infty)$$

RELATION FUNCTION

2 Bracket's Inequality

Bhalo f(x) का पाइया
f(x) ∈ ℝ
कि f(x) बड़े से बड़ा
(छोटे से छोटा)

$$\begin{aligned} & \text{Q } 8m^2\theta - \frac{1}{4} \geq 0 \\ & (8m\theta - \frac{1}{2})(8m\theta + \frac{1}{2}) \geq 0 \\ & \left(+\frac{1}{2} \right) \quad \left(-\frac{1}{2} \right) \\ & 8m\theta \leq -\frac{1}{2} \vee 8m\theta \geq \frac{1}{2} \end{aligned}$$

$$\begin{aligned} & \text{Q } x^2 - x - 6 < 0 \\ & (x-3)(x+2) < 0 \\ & \textcircled{3} \quad \textcircled{-2} \\ & -2 < x < 3 \\ & x \in (-2, 3) \end{aligned}$$

Bhalo f(x) का आर
कि f(x) दरेगा
दरेगा छह.
3 अपनी

RELATION FUNCTION

Modulus Inequality

(1) $f(x) = |x|$ is Modulus fmn

$$(2) |x| = \sqrt{x^2}$$

$$|x-1| = \sqrt{(x-1)^2}$$

$$|x+3| = \sqrt{(x+3)^2}$$

$$|smol| = \sqrt{m^2b}$$

Modulus Sajjan.

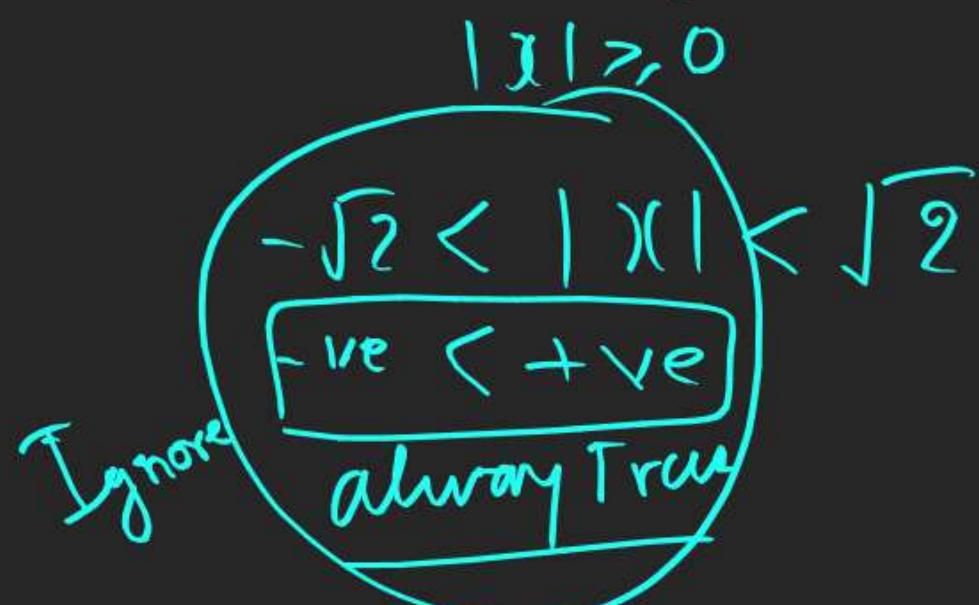
$$|-2| = -(-2) = 2$$

$$|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$$

Mod Kandr betnaf hn agr +ve hai
to as it is Bairur Nikal dega
Agr andr betnaf -ve hai to Minus
K sath NiKalega

RELATION FUNCTION

(4) $|x|$ is always +ve (NN)



$$\begin{aligned} |x| &\Rightarrow |x| < \sqrt{2} \\ 0 & |x+5| \quad |x-2| \\ &x=5 \quad 2 \end{aligned}$$

(5) Modulus Inequality

Q $|x| \leq 2$ find x

$$\Rightarrow \sqrt{x^2} \leq 2$$

Sqr $x^2 \leq 4$

$$x^2 - 4 \leq 0$$

$\therefore (x-2)(x+2) \leq 0$

$$-2 \leq x \leq 2$$

$$x \in [-2, 2]$$

G HODA

Method

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



$$x \in [-2, 2]$$

RELATION FUNCTION

$$Q \quad |x-4| \leq 2$$



$$x \in [2, 6]$$

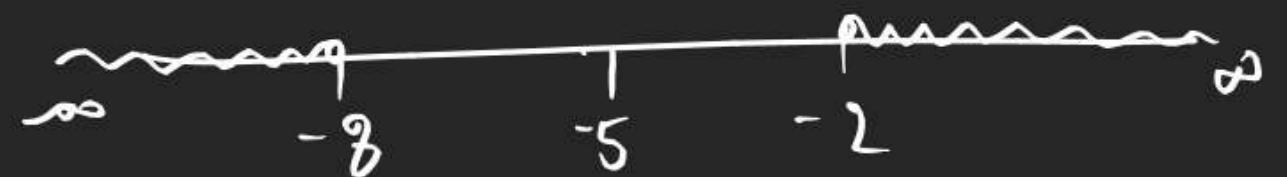
$$Q \quad |x-4| \geq 2$$



$$x \in (-\infty, 2] \cup [6, \infty)$$

Urthan \Rightarrow Bahar Ki Ghaz

$$\emptyset \mid |x+5| > 3 \text{ Russi}$$



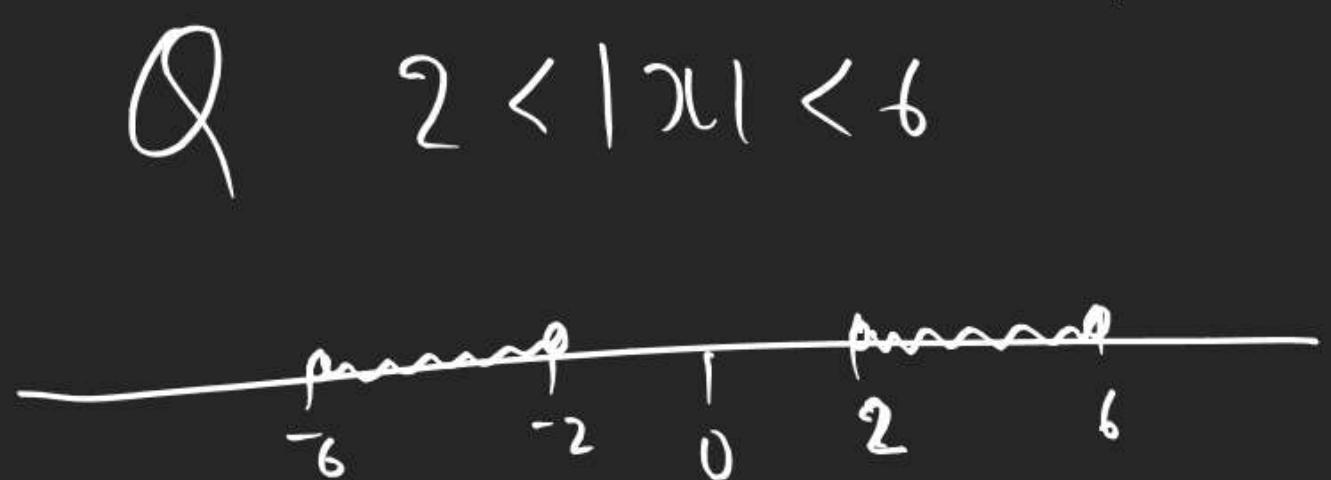
$$x \in (-\infty, -8) \cup (-2, \infty)$$

$$\emptyset \mid |x+7| \leq 10 \text{ Russi}$$

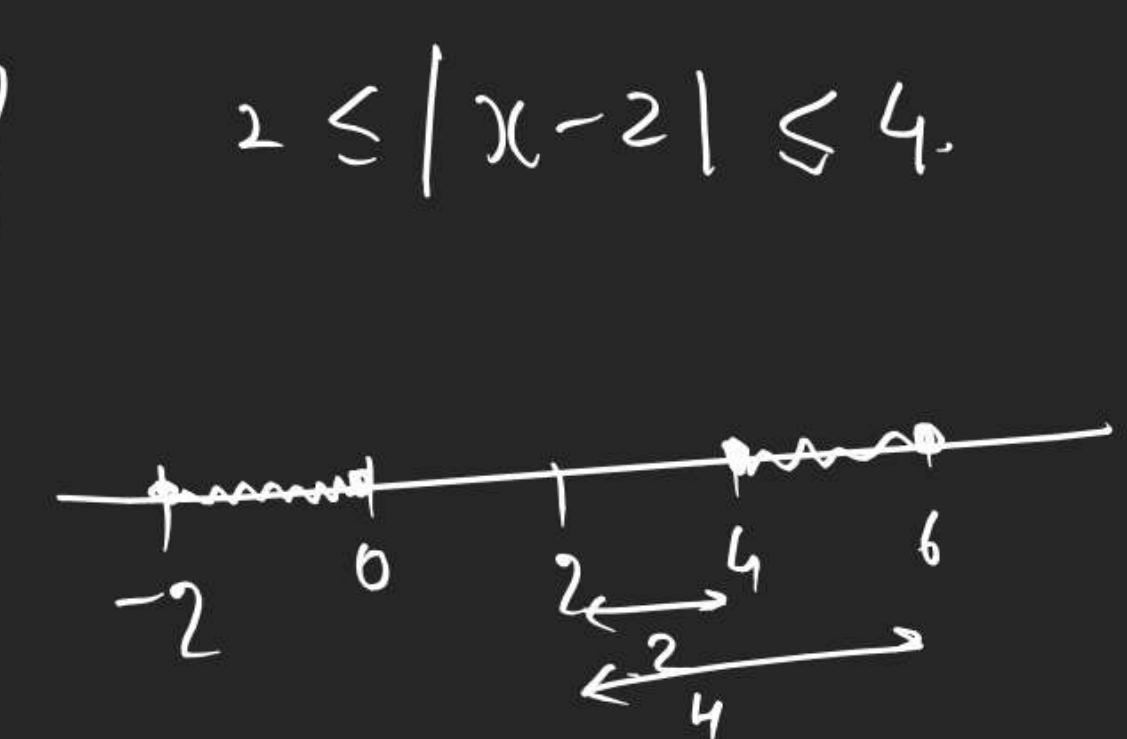


$$x \in [-17, 3]$$

2, 6 Imbhuvi



$$\lambda \in (-6, -2) \cup (2, 6)$$



$$\lambda \in [-2, 0] \cup [4, 6]$$

Q

$$5 \leq |x-3| \leq 7$$



$$x \in [-4, -2] \cup [8, 10]$$

$$|x-4| < 2$$



$$x \in (2, 6) - \{4\}$$

Q If $f(x) = \frac{1}{\sqrt{|x-4|} - 1}$ find Dom.

$\frac{1}{\sqrt{f(x)}} \text{ type}$

$$\left| \frac{2}{|x-4|} \right| - 1 > 0$$

$$\Rightarrow \left| \frac{2}{|x-4|} \right| > 1$$

$$\Rightarrow \frac{|2|}{|x-4|} > 1 \Rightarrow \frac{2}{|x-4|} > 1$$

+ + - -

(4) Domain (Advance)

$$Y = \sin^{-1} f(x) \quad \& \quad Y = \tan^{-1} f(x) \text{ 's domain}$$

$-1 \leq f(x) \leq 1 \quad \& \text{ solve}$

Q. $Y = \sin^{-1}(x+3)$ find Dom?

$$-1 \leq (x+3) \leq 1 \quad -3$$

$$-4 \leq x \leq -2$$

$$x \in [-4, -2]$$

Q. $Y = \sin^{-1}(4x-1)$ find Dom?

$$-1 \leq 4x-1 \leq 1 \quad +1$$

$$0 \leq 4x \leq 2 \quad \div 4$$

$$0 \leq x \leq \frac{1}{2}$$

$$x \in [0, \frac{1}{2}]$$

$$Q \quad f(x) = \cos^{-1}\left(\frac{1-|x|}{2}\right) \text{ find Dom?}$$

$$-1 \leq \frac{1-|x|}{2} \leq 1 \quad \times 2$$

$$-2 \leq 1-|x| \leq 2 \quad \textcircled{-1}$$

$$-3 \leq -|x| \leq 1 \quad \textcircled{-1x}$$

$$3 \geq |x| \geq -1$$

\oplus > -ve

AT

Ignore.

$$|x| \leq 3$$

$$x \in [-3, 3]$$



$$Q \quad f(x) = \cos\left(\frac{1-2|x|}{3}\right) \text{ find Dom?}$$

$$-1 \leq \frac{1-2|x|}{3} \leq 1 \quad \times 3$$

$$-3 \leq 1-2|x| \leq 3 \quad \textcircled{-1}$$

$$-4 \leq -2|x| \leq 2 \quad \textcircled{x-1} \quad : 2$$

$$4 \geq 2|x| \geq -2$$

$$2 \geq |x| \geq -1$$

$$|x| \leq 2 \quad x \in [-2, 2]$$



Q. Find Dom of $y = \ln\left(\frac{1+x^2}{2x}\right)$

$$\Rightarrow \boxed{-1 \leq x \leq 1}$$

*Self
Under
standing*

$$\begin{cases} -1 < \frac{1+x^2}{2x} \leq 1 \\ \left| \frac{1+x^2}{2x} \right| \leq 1 \end{cases} \Rightarrow \frac{|1+x^2|}{|2x|} \leq 1 \Rightarrow \frac{1+x^2}{2|x|} \leq 1$$

$$\Rightarrow 1+x^2 \leq 2|x| \Rightarrow |x|^2 - 2|x| + 1 \leq 0$$

$$\Rightarrow (|x|-1)^2 \leq 0 \Rightarrow (|x|-1)^2 = 0 \Rightarrow |x|-1=0$$

$$|x|=1 \Rightarrow x=\pm 1 \Rightarrow \boxed{\text{Dom } \{ -1, 1 \}}$$

Q) find Dom of

$$\textcircled{1} \quad y = \frac{1}{\sqrt{1-|x|}}$$

$$\textcircled{2} \quad y = \frac{1}{|1-|x||}$$

$$\textcircled{3} \quad y = \sqrt{2-2x+x^2}$$

$$\left. \begin{array}{l} \textcircled{4} \quad y = \sqrt{2-|x-3|} \\ \textcircled{5} \quad y = \ln\left(\frac{x^2}{2}\right) \\ \textcircled{6} \quad y = \ln(4x-1) \end{array} \right\}$$

7) If $f(x) = \frac{(x-1)^{10000} (x-\frac{2}{3})^{57} (x-7)^4 (x+\frac{8}{7})^{927}}{(x+3)^{17} (x-2)^6 (x+6)^{12}}$

then $x \in \dots$
 if $f(x) > 0$

(8) find Dom of
 $y = \sqrt{\frac{1-|x|}{2-|x|}}$