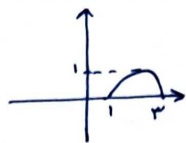
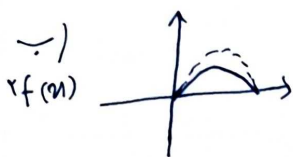


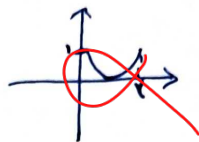
۲) $f(x-1)$



۱۸, ۱۵



$\frac{1}{2} f(x)$



الف) $x^2 - 3x + 2 > 0$
 $(x-1)(x-2) > 0$

$\frac{1}{x-1} + \frac{1}{x-2} > 0$
 $D_f = (-\infty, 0) \cup (2, +\infty)$

۲) $x^2 + 4x + 4 > 0$
 $(x+1)(x+2) > 0$

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

$D_f = (-\infty, -2] \cup [-1, +\infty)$
 $x \leq -2$ و $x \geq -1$

ب) $x^2 - 4x + 4 < 0$
 $(x-1)(x-3) < 0$

$\frac{1}{x-1} - \frac{1}{x-3} < 0$

$D_f = (1, 3)$ $1 < x < 3$

۳) $x^2 - 5x + 4 < 0$
 $(x-1)(x-4) < 0$

$\frac{1}{x-1} - \frac{1}{x-4} < 0$

$D_f = [1, 4]$ $1 \leq x \leq 4$

الف) $\frac{x^2 - 3x + 2}{x-5} < 0$ $\xrightarrow{\text{مجموع ضرایب مثبت برابر با منفی است}}$ $\frac{(x-1)(x-2)}{x-5} < 0$

$\frac{1}{x-1} + \frac{1}{x-2} - \frac{1}{x-5} < 0$ $D_f = (-\infty, 1) \cup (2, 5)$
 $x < 1$ و $2 < x < 5$

ب) $\frac{x^2 - 1}{x^2 - 4x + 4} > 0 \rightarrow \frac{(x+1)(x-1)}{(x-2)(x-1)} > 0$

$\frac{1}{x+1} - \frac{1}{x-2} > 0$ $D_f = (-\infty, -1] \cup (2, +\infty)$
 $x \leq -1$ و $2 < x$

الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - x}} \rightarrow \frac{x^2 - 1}{x^2 - x} > 0 \rightarrow \frac{x^2 - 1}{x(x-1)} > 0$

$\frac{1}{x-1} + \frac{1}{x} > 0$ $D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 4}{x^2 - 5x + 4}} \rightarrow \frac{x^2 - 4}{x^2 - 5x + 4} > 0 \rightarrow \frac{(x+2)(x-2)}{x^2 - 5x + 4} > 0$

$\frac{1}{x+2} - \frac{1}{x-2} > 0$ $D_f = (-\infty, -2] \cup [2, +\infty)$

یا بین صفر مطالعه شود

الف) $y = \sqrt{4 - \sqrt{2-x}}$ $\frac{2-x}{2} > 0$ $\frac{2-x}{2} > 0$

$D_f = -1 \leq x \leq 2 \rightarrow D_f = [-1, 2]$

$4 - \sqrt{2-x} > 0 \rightarrow 4 > \sqrt{2-x} \rightarrow 16 > 2-x \rightarrow -1 \leq x$

ب) $y = \sqrt{3 - \sqrt{x-2}}$

$x-2 > 0 \rightarrow x > 2$

$D_f = 2 \leq x \leq 11 \rightarrow D_f = [2, 11]$

$3 - \sqrt{x-2} > 0 \rightarrow \sqrt{x-2} < 3 \rightarrow x-2 < 9 \rightarrow x < 11$

الف) $y = \sqrt{4-x^2}$
 $4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$
 $D_f = [-2, 2]$

ب) $y = \sqrt{3|x|-9}$
 $3|x|-9 \geq 0 \rightarrow |x| \geq 3 \rightarrow x \leq -3 \text{ or } x \geq 3$
 $D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt{\frac{|x|+1}{|x|-3}}$ فرقیات $\mathbb{R} - \{\pm 3\} = D_f$

ب) $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ $x \geq 0$
 $\sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9$
 $D_f = [0, +\infty) - \{9\} = [0, 9) \cup (9, +\infty)$

الف) $y = \frac{\sin x}{x \cos x - 1}$ $x \cos x \neq 1$
 $\cos x \neq \frac{1}{x}$ $D_f = \mathbb{R} - \{xk \pm \frac{\pi}{x}\}$

ب) $y = \frac{\cos x + 1}{x \sin x + 1}$ $x \sin x \neq -1$
 $\sin x \neq -\frac{1}{x}$ $D_f = \mathbb{R} - \{xk\pi - \frac{\pi}{x}, xk\pi + \frac{\pi}{x}\}$

ج) $y = \frac{\tan x + x}{\cot x - 1}$ $\cot x \neq 1$
 $\rightarrow \frac{\cos x}{\sin x} \neq 1$ $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$

د) $y = \frac{\sin x + 1}{x \sin^2 x - 3}$ $x \sin^2 x \neq 3$
 $\sin^2 x \neq \frac{3}{x} \rightarrow \sin x \neq \pm \sqrt{\frac{3}{x}}$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{x}\}$

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

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

$x|x-2| > \frac{1}{x}$
 $|x-2| > \frac{1}{x^2}$
 $x-2 > \frac{1}{x^2} \rightarrow x > \frac{2}{x^2}$
 $x-2 < -\frac{1}{x^2} \rightarrow x < \frac{2}{x^2}$
 $D_f = (-\infty, \frac{2}{x^2}) \cup (\frac{2}{x^2}, +\infty)$

الف) $y = \sqrt{4-2|x|}$ $D_f = [-2, 2]$

$4-2|x| \geq 0$
 $2|x| \leq 4 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$

ب) $y = \sqrt{\frac{|x|}{|x|}}$ $D_f = \mathbb{R} - \{0\} = (-\infty, 0) \cup (0, +\infty)$

نمونه با بد مخالف صفر باشد پس غلط عدد منفی نمی تواند باشد

$$\frac{(n-1)(n+1)}{(n-1)(n-1)} \geq 0 \rightarrow$$

$$\begin{array}{ccccccc} & -1 & & 1 & & *1 & \\ + & | & - & | & + & | & + \\ & 0 & & 0 & & 0 & \end{array}$$

-1

1

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