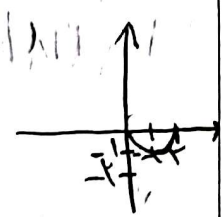
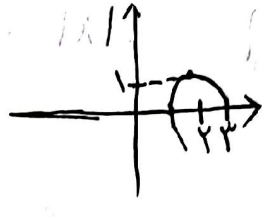


۲۰ آفرین

الف) $-f(x)$ ج) $f(x-1)$ ب) $f(x)$ د) $f(x)+2$ راف



Q ✓

$(x-1)(x-2) > 0$ (الف)
 x | 1 | 2 |
 + | - | +
 $\Rightarrow x \in (-\infty, 1) \cup (2, +\infty)$

$(x+1)(x+4) < 0$ (ب)
 x | -1 | -4 |
 - | + | -
 $\Rightarrow x \in (-4, -1)$

الحل: $x \in (-\infty, 1) \cup (2, +\infty) \cap (-4, -1) = \emptyset$

$$2) \left(\frac{x+1}{x} \right) > 0 \quad x \in (-\infty, -1) \cup (0, +\infty)$$

الف) $(x-2)(x-1) < 0$

$\omega \rightarrow x - \omega$

x	1	2	ω
	-	+	+

$\Rightarrow x \in (-\infty, 1) \cup (2, +\infty)$

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

$$(x-1) \cancel{(x-1)} \geq 0$$

$$x-1 \geq 0$$

$$x \geq 1$$

$$y = \sqrt{\frac{x^3-1}{x^3-x}} \Rightarrow \frac{x^3-1}{x^3-x} \geq 0 \quad (*)$$

7. $\sqrt{\frac{x^2-19}{x^2+8x+7}}$

$(x-5)(x+7)$

$(x-5)(x-1)$

$f(x) = \frac{(x-5)(x-1)}{(x-5)(x+7)}$

$f(x) = \frac{(x-1)}{(x+7)}$

$D_f = (-\infty, -7] \cup (-1, \infty)$

$V(0, 1) \cup (1, \infty)$

الف، $g = \sqrt{4 - \sqrt{2-x}} \Rightarrow 1-x \geq 0 \Rightarrow x \leq 1$
 $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4$
 $1-x \leq 19$
 $2-x \leq 14$
 $D_f = [-14, +\infty]$

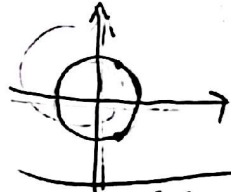
$$b) y_2 = \sqrt{x-1} \Rightarrow \begin{cases} x-1 \geq 0 \Rightarrow x \geq 1 \\ \sqrt{x-1} \geq 0 \Rightarrow \sqrt{x-1} \geq 0 \Rightarrow x-1 \geq 0 \Rightarrow x \geq 1 \end{cases} \Rightarrow x \geq 1$$

الف) $y = \sqrt{r - rx^2} \Rightarrow r - rx^2 \geq 0 \quad rx^2 \leq r \Rightarrow x^2 \leq 1 \Rightarrow x \in [-1, 1]$
 $\text{Df} = [-1, 1]$
 (ب) ✓

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

الف) $y = \sqrt{\frac{|x| + 1}{|x| - 3}}$ $|x| - 3 \neq 0 \Rightarrow |x| \neq 3 \Rightarrow x \neq \pm 3$
 $\text{Df} = \mathbb{R} - \{\pm 3\}$
 (ب) ✓

ب) $y = \sqrt{\frac{\sqrt{x} + 1}{\sqrt{x} - 3}}$ $\sqrt{x} - 3 \neq 0 \Rightarrow \sqrt{x} \neq 3 \Rightarrow x \neq 9, x \geq 0$
 $\text{Df} = [0, +\infty) - \{9\}$

الف) $r \cos x - 1 \neq 0 \Rightarrow r \cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{r}$ (2) $\cos x = \frac{1}{r} \Rightarrow x = \pm \arccos \frac{1}{r}$
 $\Rightarrow \text{Df} = \mathbb{R} - \{k\pi \pm \arccos \frac{1}{r}\}$


ب) $r \sin x \neq 0 \Rightarrow \sin x \neq 0 \Rightarrow x \neq k\pi$
 $\text{Df} = \mathbb{R} - \{k\pi\}$


$|x - 2| - \frac{1}{r} > 0 \Rightarrow |x - 2| > \frac{1}{r}$
 $|x - 2| > \frac{1}{r} \Rightarrow \begin{cases} x - 2 > \frac{1}{r} \\ x - 2 < -\frac{1}{r} \end{cases} \Rightarrow \begin{cases} x > 2 + \frac{1}{r} \\ x < 2 - \frac{1}{r} \end{cases}$
 $\text{Df} = (-\infty, 2 - \frac{1}{r}) \cup (2 + \frac{1}{r}, +\infty)$
 (ب) ✓

الف) $r < |x| \Rightarrow |x| > r \Rightarrow x > r \text{ or } x < -r$
 $\text{Df} = (-\infty, -r) \cup (r, +\infty)$
 (ب) ✓

ب) $y = \sqrt{\frac{|x|}{|x| + 1}}$ $\frac{|x|}{|x| + 1} \geq 0 \Rightarrow |x| \geq 0 \Rightarrow x \in \mathbb{R}$
 $\text{Df} = \mathbb{R}$