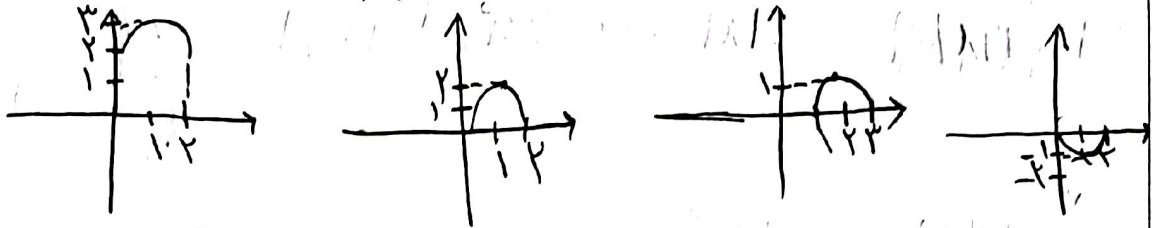


الف) $f(x) + 2$ ب) $2f(x)$ ج) $f(x-1)$ د) $-f(x)$



الف) $(x-2)(x-3) > 0$ ب) $x(x+1) < 0$

x x

+	0	-	0	+
---	---	---	---	---

$\Rightarrow x \in (-\infty, 2) \cup (3, +\infty)$

-	0	+	0	-
---	---	---	---	---

$x \in (-1, 0) \cup (0, +\infty)$

ج) $(x+1)(x+4) > 0$ د) $(x-1)(x-9) \leq 0$

x x

-	0	-	0	+
---	---	---	---	---

$x \in (-\infty, -1) \cup (-4, +\infty)$

+	0	-	0	+
---	---	---	---	---

$x \in [1, 9]$

الف) $(x-1)(x-1) < 0$ ب) $(x-1)(x+1) > 0$

x x

-	0	-	0	+
---	---	---	---	---

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

+	0	-	0	+
---	---	---	---	---

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

ج) $y = \sqrt{\frac{x^2-1}{x^2-x}} \Rightarrow \frac{x^2-1}{x^2-x} \geq 0$

x x

+	0	-	0	+
---	---	---	---	---

$\Rightarrow D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

د) $y = \sqrt{\frac{x^2-14}{x^2+x+4}} \Rightarrow \frac{x^2-14}{x^2+x+4} \geq 0$

x x

+	0	-	0	+
---	---	---	---	---

$\Rightarrow D_f = (-\infty, -5] \cup (-1, 4) \cup (4, +\infty)$

الف) $y = \sqrt{4-\sqrt{2-x}} \Rightarrow 4-\sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4 \Rightarrow 2-x \leq 16 \Rightarrow x \geq -14$

ب) $y = \sqrt{3-\sqrt{x-1}} \Rightarrow 3-\sqrt{x-1} \geq 0 \Rightarrow \sqrt{x-1} \leq 3 \Rightarrow x-1 \leq 9 \Rightarrow x \leq 10$

$\Rightarrow D_f = [-14, 10]$

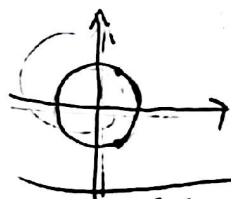
الف) $y = \sqrt{r - rx^2} \Rightarrow r - rx^2 \geq 0 \quad rx^2 \leq r \Rightarrow x^2 \leq 1 \Rightarrow x \in [-1, 1]$

ب) $y = \sqrt{r|x| - 9} \Rightarrow r|x| - 9 \geq 0 \Rightarrow |x| \geq \frac{9}{r} \Rightarrow x \in (-\infty, -\frac{9}{r}] \cup [\frac{9}{r}, +\infty)$

الف) $y = \sqrt{\frac{|x|+1}{|x|-r}}$ $|x|-r \neq 0 \Rightarrow |x| \neq r \Rightarrow x \neq \pm r$
 $D_f = \mathbb{R} - \{\pm r\}$

ب) $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-r}}$ $\sqrt{x}-r \neq 0 \Rightarrow \sqrt{x} \neq r \Rightarrow x \neq r^2$
 $D_f = [0, +\infty) - \{r^2\}$

الف) $r \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{r}$ $\cos x \neq \frac{1}{r} \Rightarrow x \neq \pm \arccos \frac{1}{r}$
 $D_f = \mathbb{R} - \{\pm \arccos \frac{1}{r}\}$



ب) $r \sin x - 1 \neq 0 \Rightarrow \sin x \neq \frac{1}{r}$ $\sin x \neq \frac{1}{r} \Rightarrow x \neq \pm \arcsin \frac{1}{r}$
 $D_f = \mathbb{R} - \{\pm \arcsin \frac{1}{r}\}$



$|x-r| > \frac{1}{r} \Rightarrow |x-r| > \frac{1}{r} \Rightarrow x-r > \frac{1}{r} \text{ or } x-r < -\frac{1}{r}$
 $x > \frac{1}{r} + r \text{ or } x < r - \frac{1}{r}$
 $D_f = (-\infty, r - \frac{1}{r}) \cup (\frac{1}{r} + r, +\infty)$

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

ب) $y = \sqrt{\frac{|x|}{|x|+r}} \Rightarrow \frac{|x|}{|x|+r} \geq 0 \Rightarrow |x| \geq 0 \Rightarrow x \in \mathbb{R}$
 $D_f = \mathbb{R}$