

سوال (1)

$$y = \frac{x+8}{4x^3 - 20x^2 + 31x - 15} \quad \text{الف)}$$

$$4 - 20 + 31 - 15 = 0 \Rightarrow \text{بر } x-1 \text{ کس بنیاد}$$

$$\begin{array}{r} 4x^3 - 20x^2 + 31x - 15 \quad | \quad x-1 \rightarrow \text{سے } (1) \\ - (4x^3 - 4x^2) \\ \hline -16x^2 + 31x - 15 \\ - (-16x^2 + 16x) \\ \hline 15x - 15 \\ - (15x - 15) \\ \hline 0 \end{array}$$

$$\begin{array}{r} \downarrow \\ x^2 - 16x + 40 \\ \downarrow -4x + 10 \\ \text{سے } = \frac{+4}{-4} = \left(\frac{1}{-1}\right) \\ \frac{10}{-4} = \left(\frac{-5}{2}\right) \end{array}$$

$$D(f) = \mathbb{R} - \left\{ \frac{1}{4}, \frac{5}{2}, 1 \right\}$$

$$\text{ب) } y = \frac{x+3}{3x^3 - x^2 - 11x - 8}$$

$$-8 - 1 = -11 + 3 \Rightarrow \text{بر } x+1 \text{ کس بنیاد}$$

$$D(f) = \mathbb{R} - \left\{ -1, 2, \frac{4}{3} \right\}$$

$$\begin{array}{r} 3x^3 - x^2 - 11x - 8 \quad | \quad x+1 \rightarrow \text{سے } (-1) \\ - (3x^3 + 3x^2) \\ \hline -4x^2 - 11x - 8 \\ - (-4x^2 - 4x) \\ \hline -7x - 8 \\ - (-7x - 7) \\ \hline -1 \end{array}$$

$$\begin{array}{r} \downarrow \\ x^2 - 4x - 12 \\ \downarrow -4x + 12 \\ \text{سے } = \frac{+4}{-4} = (-1) \\ \frac{-1}{-4} = \left(\frac{1}{4}\right) \end{array}$$

(سوال ۲)

$$\text{الف) } y = \frac{x+1}{x-\sqrt{1-2x}}$$

$$x - \sqrt{1-2x} \neq 0$$

$$\Rightarrow x \neq \sqrt{1-2x}$$

$$\text{نایه} \quad x = \sqrt{1-2x} \Rightarrow \text{if } x \geq 0 \Rightarrow x^2 = 1-2x \Rightarrow$$

انلود

باشه

$$x^2 + 2x - 1 = 0 \Rightarrow$$

$$-1 \times 1$$

$$x = 1 \text{ و } x = -2$$

$$D_{(f)} = \mathbb{R} - \{1\}$$

$$\Leftarrow \text{خارج از حوض تقسیم } x \geq 0$$

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

$$x - \sqrt{1^2x-2} \neq 0$$

$$\Rightarrow x \neq \sqrt{1^2x-2}$$

$$\text{نایه} \quad x = \sqrt{1^2x-2} \Rightarrow \text{if } x \geq 0 \Rightarrow x^2 = 1^2x-2 \Rightarrow$$

انلود

باشه

$$x^2 - 1^2x + 2 = 0 \Rightarrow x = 1 \text{ و } x = 2$$

$$D_{(f)} = \mathbb{R} - \{1, 2\} \Leftarrow \text{حد قابل قبول اند}$$

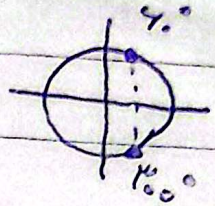
سوال (۳)

الف) $y = \frac{\sin x}{r \cos x - 1}$

$r \cos x - 1 \neq 0 \Rightarrow$

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

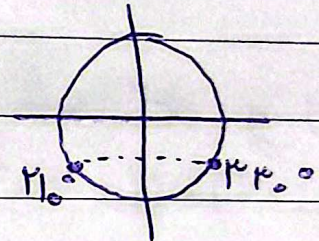
$D(f) = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{r}, 2k\pi - \frac{\pi}{r} \right\}$



ب) $y = \frac{\cos x + 1}{r \sin x + 1}$

$r \sin x + 1 \neq 0 \Rightarrow \sin x \neq -\frac{1}{r}$

$D(f) = \mathbb{R} - \left\{ 2k\pi + \frac{\sqrt{r}}{r}, 2k\pi - \frac{\pi}{r} \right\}$

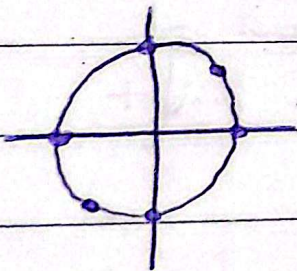


ج) $y = \frac{\tan x + r}{\cot x - 1}$

$\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1$

$\cot = \frac{\cos}{\sin} \Rightarrow \sin x \neq 0$

$\tan = \frac{\sin}{\cos} \Rightarrow \cos x \neq 0$

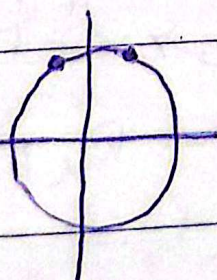


$D(f) = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right\}$

د) $y = \frac{\sin^r x + 1}{r \sin^r x - r}$

$r \sin^r x - r \neq 0 \Rightarrow \sin^r x \neq \frac{r}{r}$

$\Rightarrow \sin x \neq \sqrt[r]{r}$



$D(f) = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{r}, \right.$

$\left. 2k\pi + \frac{\pi}{r} \right\}$

سوال ١٢

$$\text{الف) } x^2 - 5x + 6 > 0 \Rightarrow (x-2)(x-3) > 0 \Rightarrow$$

$$\begin{array}{c} \downarrow \quad \downarrow \\ -2x - 1^6 \end{array}$$

$$\begin{array}{c} 2 \quad 3 \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$D(p) = (-\infty, 2) \cup (3, +\infty)$$

$$\text{ب) } x^2 - 4x + 4 < 0$$

$$\downarrow$$

$$-2x - 1$$

$$\begin{array}{c} 1 \quad 2 \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$\text{نقاط: } 2, 2$$

$$D(p) = (2, 2)$$

$$\text{ج) } x^2 + 4x + 4 \geq 0$$

$$4+1=5 \Rightarrow \text{نقاط: } -1, -2$$

$$\begin{array}{c} -2 \quad -1 \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$D(p) = [-1, +\infty) \cup (-\infty, -2]$$

$$\text{د) } x^2 - 7x + 6 \leq 0$$

$$1-7+6=0 \Rightarrow \text{نقاط: } 1, 6$$

$$\begin{array}{c} 1 \quad 6 \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$D(p) = [1, 6]$$

سوال (۵)

ساده ۲ را

$$(الف) \frac{x^2 - 3x + 2}{x - 2} < 0$$

توان $\Rightarrow$ ریشه خارج: ۵

۱	۲	۵
$\ominus$	$\oplus$	$\ominus$
$\oplus$	$\oplus$	$\oplus$

$$D(f) = (-\infty, 1) \cup (2, 5)$$

ساده ۱ و ۱ -

$$(ب) \frac{x^2 - 1}{x^2 - 4x + 5} \geq 0$$

ساده ۵ او

مشتق

-1	1	5
$\oplus$	$\ominus$	$\oplus$
$\oplus$	$\oplus$	$\oplus$

$$D(f) = (-\infty, -1] \cup (5, +\infty)$$

سوال (۶)

(الف) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}}$

$$\frac{x^2 - 4x + 3}{x^2 - 1} \geq 0$$

خرج ۱ =

ساده ۱ و ۳

۱	۳
$\oplus$	$\oplus$
$\oplus$	$\oplus$

$$D(f) = [3, +\infty)$$

(ب) $y = \sqrt[3]{\frac{x^2 - 4x + 3}{x^2 - 1}}$ ریشه ۳ ندارد = فقط خارج $\neq 0$

$$D(f) = \mathbb{R} - \{-1, 1\} \quad x^2 - 1 \neq 0 \Rightarrow x \neq \pm 1$$

(سوال ۷)

$$\text{الف) } y = \log(x^2 - 3x)$$

$$x^2 - 3x > 0 \Rightarrow$$

$$x(x-3) > 0 \Rightarrow$$

$$\begin{array}{c} 0 \quad 3 \\ + \quad | \quad - \quad | \quad + \end{array}$$

$$D(f) = (3, +\infty) \cup (-\infty, 0)$$

$$\text{ب) } y = \log \frac{14 - x^2}{|x-2|}$$

$$14 - x^2 > 0 \Rightarrow$$

$$\begin{array}{c} -4 \quad 4 \\ - \quad | \quad + \quad | \quad - \\ -4 < x < 4 \end{array}$$

$$|x-2| > 0 \Rightarrow |x| > 2 \Rightarrow$$

$$x < -2 \cup 2 < x$$

$$|x-2| \neq 1 \Rightarrow |x| \neq 3 \Rightarrow x \neq 3$$

$$x \neq -3$$

$$D(f) = ((-3, -2) \cup (2, 3)) - \{3, -3\}$$

$$3, 4$$

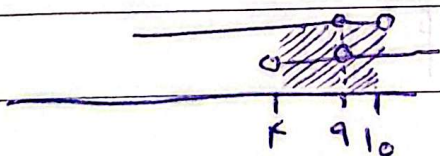
$$\text{ج) } y = \log \frac{x^2 - 7x + 12}{10 - x}$$

$$\frac{x^2 - 7x + 12}{x-3} > 0 \Rightarrow$$

$$\frac{(x-3)(x-4)}{x-3} > 0 \Rightarrow$$

$$x < 4$$

$$\begin{array}{c} 3 \quad 4 \\ - \quad | \quad + \end{array}$$



$$10 - x > 0 \Rightarrow 10 > x$$

$$10 - x \neq 1 \Rightarrow x \neq 9$$

$$D(f) = (3, 4) \cup (4, 10)$$

$$2) y = \sqrt{x^2 - 11x + 18} + \log_x \sqrt{4 - x^2}$$

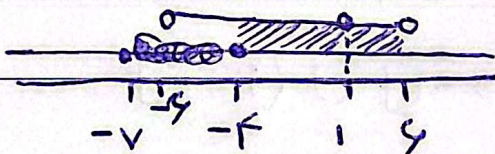
$$\sqrt{4 - x^2} > 0 \Rightarrow 4 - x^2 > 0 \Rightarrow \begin{array}{c} -4 \quad 4 \\ - \quad + \quad - \end{array}$$

$$-4 < x < 4$$

$$x > 0 \quad x \neq 1$$

$$x^2 - 11x + 18 \geq 0 \Rightarrow \begin{array}{c} - \quad + \\ + \quad - \quad + \end{array} \quad x \leq -2 \cup -5 \leq x$$

$\swarrow$
 $-x - 2$

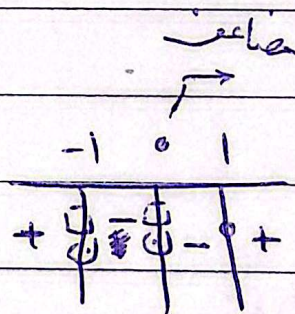


$$D_f = (-5, -2) \cup (1, 4)$$

$$y = \frac{x^2 - x}{x^2 + x}$$

$\swarrow$
 $x(x-1)$

$\swarrow$
 $x(x+1)$



سوال 1

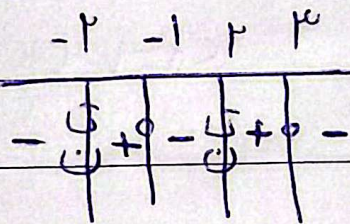
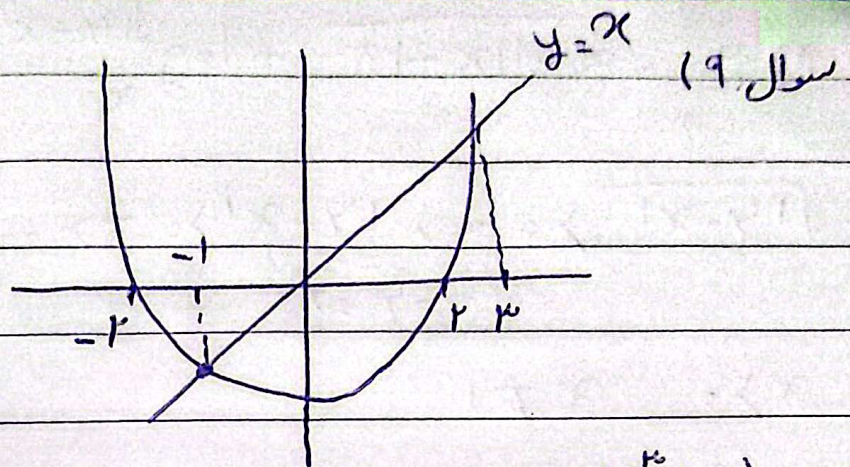
سج

	-1	0	1
$x^2 - x$	+	+	-
$x^2 + x$	+	-	+
P	+	-	+

آیا کافی

$$y = \sqrt{\frac{x - P(x)}{P(x)}}$$

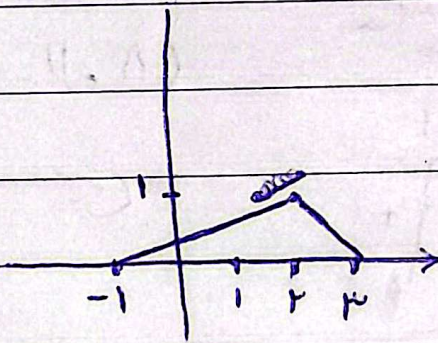
$\rightarrow -1$ و 3
 $\rightarrow -2$ و 2



$$\frac{x - P(x)}{P(x)} \geq 0$$

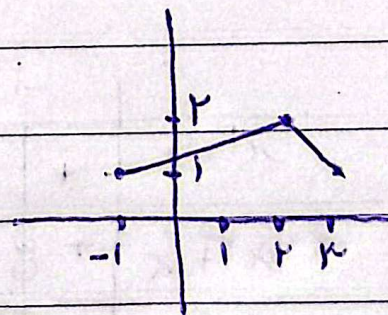
$\rightarrow -1$ و 3
 $\rightarrow -2$ و 2

$$D(P) = (-2, -1] \cup (2, 3]$$

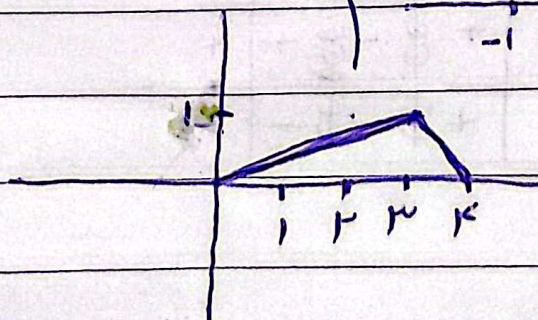


سوال 10

الف) $P(x) + 1$



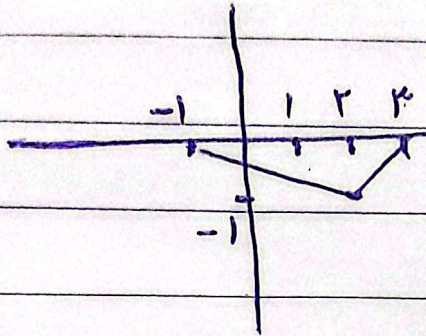
ب) $P(x) - 1$



Date

Subject

ج) $-P(x)$



د) $P(x+1) + 1$

