

بنا خدا

ب) $\sqrt{\frac{x^3 - 2x^2 - 5x + 6}{x^3 + 2x^2 - 5x - 6}} = \frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}$ (2)

$$\begin{array}{r} x^3 - 2x^2 - 5x + 6 \div (x-1) \\ \underline{-x^3 + x^2} \\ -x^2 - 5x + 6 \\ \underline{+x^2 + x} \\ -4x + 6 \\ \underline{+4x - 4} \\ 2 \end{array} \quad \begin{array}{r} x^3 + 2x^2 - 5x - 6 \div (x+1) \\ \underline{-x^3 - x^2} \\ 3x^2 - 5x - 6 \\ \underline{-3x^2 - 3x} \\ -2x - 6 \\ \underline{+2x + 2} \\ -4 \end{array}$$

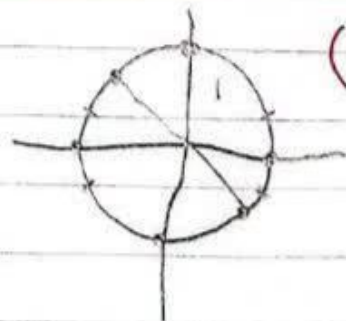
x	-3	-2	-1	1	2	3
P	+	-	+	-	+	-

$\rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $[-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow x \in (-\infty, -2]$ (✓)

ب) $[x^2] - 2[x] - 3 = 0 \rightarrow ([x] - 3)([x] + 1)$
 $[x] = 3 \rightarrow [3, 4) \rightarrow \emptyset$
 $[x] = -1 \rightarrow [-1, 0) \rightarrow \emptyset$

الف) $\frac{\cos x + \sin x}{\sin x} = \csc x \neq 0$
 $\frac{\sin x + \cos x}{\cos x} = \sec x \neq 0$
 $\sin x \neq -\cos x$



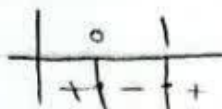
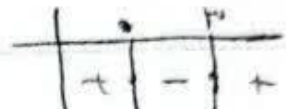
$D_y = \mathbb{R} - \left\{ k\frac{\pi}{2}, k\pi - \frac{\pi}{2} \right\}$

ب) $y = \sqrt{1 - 4\sin^2 x} \rightarrow (1 - 4\sin^2 x)(1 + 4\sin^2 x) \geq 0$

$1 - 4\sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow \sin x \leq \frac{1}{2} \cup \sin x \geq -\frac{1}{2}$
 $\rightarrow \left[\frac{\pi}{6}, \frac{5\pi}{6} \right] \cup \left[\frac{7\pi}{6}, \frac{11\pi}{6} \right]$ (✓)

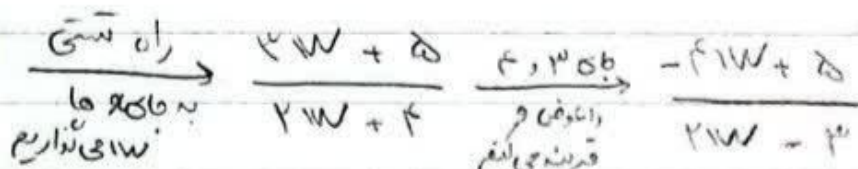
(9)

الف) $x-1 > 0$, $\log_{\frac{1}{2}} x-1 \leq 1 \rightarrow x-1 \geq \frac{1}{2} \rightarrow x \geq \frac{3}{2}$
 $D_f = [\frac{3}{2}, +\infty)$

ب) $x^2 - x \geq 0 \rightarrow x(x-1) \geq 0$   $\star$
 $\log_{\frac{1}{2}} x^2 - 3x + 1 \rightarrow x^2 - 3x + 1 \neq 5 \rightarrow x^2 - 3x - 4 \rightarrow (x-4)(x+1)$
 $x^2 - 3x > 0 \rightarrow \star$ $x \neq 4, -1$
 $\hookrightarrow D_f = (-\infty, 0] \cup (3, +\infty) - \{4, -1\}$

(10)

الف) $2^{3x-x^2} \geq 1 \rightarrow 3x - x^2 \geq 0 \rightarrow x^2 - 3x \leq 0$
 $(x-3)(x-0) \leq 0$  $\rightarrow [0, 3] = D_f$

ب) $\left(\frac{3x+5}{2x+4}\right)!$ 

راہ قریبی $\rightarrow \frac{3x+5}{2x+4} \in \mathbb{W} \rightarrow 3x+5 = 2xw+4w$

$\hookrightarrow 3x - 2xw = 4w - 5 \rightarrow x(3-2w) = 4w-5$

$x = \frac{4w-5}{3-2w} = \frac{-4w+5}{2w-3}$

جواب نہی: $\{x \mid x = \frac{-4k+5}{2k-3}, k \in \mathbb{W}\}$