

نام و نام خانوادگی : مسعودی و لاله‌وا

9

9

⑤

1, 2

9

الف) $y = \sqrt{\frac{x^2 - x - 4}{x^2 - 11x^2 + 14x}} \geq 0 \Rightarrow \frac{(x-3)(x+2)}{(x-4)(x-9)} \geq 0$

$x^2 = t \Rightarrow t^2 - 11t + 14 \rightarrow (t-4)(t-9)$, $\frac{x^2=t}{x^2=4} \rightarrow x = \pm 2$, $\frac{x^2=t}{x^2=9} \rightarrow x = \pm 3$

Sign chart: $\frac{-}{+} \frac{+}{-} \frac{-}{+} \frac{+}{-} \frac{-}{+}$ $D_f = (-\infty, -3) \cup (2, +\infty) - \{3\}$

ب) $y = \sqrt{\frac{x^3 - 2x^2 - 5x + 4}{x^3 + 12x^2 - 5x - 4}} \geq 0$

برای $x-1$ ضریب $0 =$ $\rightarrow$ ضریب $0 =$ $\rightarrow$ ضریب $0 =$ $\rightarrow$ ضریب $0 =$

Sign chart: $\frac{-}{+} \frac{+}{-} \frac{-}{+} \frac{+}{-} \frac{-}{+}$ $D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $y = \sqrt{[-x] - 2} \geq 0 \rightarrow [-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow D_f = (-\infty, -2]$

$[x] \neq -1 \rightarrow x \neq [-1, 0)$

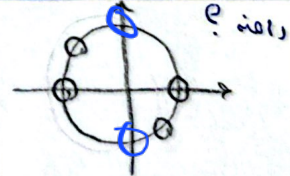
ب) $y = \frac{5x^2 + 4}{[x]^3 - 2[x] - 3} \neq 0 \rightarrow [x] = t \Rightarrow t^3 - 2t - 3 \neq 0 \Rightarrow (t-3)(t+1) \neq 0$

$[x] \neq 3 \rightarrow x \neq [3, 4)$ $D_f = \mathbb{R} - [-1, 0) \cup [3, 4)$

$\cos \neq 0$

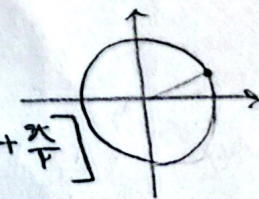
الف) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \cot = \frac{\cos}{\sin} \Rightarrow \sin \neq 0$

$\tan + 1 \neq 0 \rightarrow \tan \neq -1$ $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$



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

$-\frac{1}{2} \leq \sin x \leq \frac{1}{2}$ $D_f = [\frac{7\pi}{6}, \frac{5\pi}{6}] \cup [\frac{11\pi}{6}, \frac{3\pi}{2}]$



الف) $y = \sqrt{1 - \log_{\frac{x-1}{x}}}$. (I) $x-1 > 0 \rightarrow x > 1$

(I) $\wedge$ (II) $\rightarrow D_f = (1, \frac{1}{x}]$

(II) $\log_{\frac{x-1}{x}} < 1 \rightarrow x-1 < \frac{1}{x} \rightarrow x < \frac{1}{x} + 1 \rightarrow x < \frac{1+x}{x}$

$D_f = [\frac{1}{x}, 1)$ (circled in red)

ب) $y = \frac{\sqrt{x^2 - x}}{1 - \log_{\frac{x^2 - x}{x}}}$ $\Rightarrow$ (I) $x^2 - x > 0 \rightarrow x(x-1) > 0 \rightarrow x < 0 \vee x > 1$

(II) $x^2 - \frac{1}{x} > 0 \rightarrow x(x - \frac{1}{x}) > 0 \rightarrow x < 0 \vee x > 1$

الف) $y = \sqrt{r^{x-x^2} - 1}$ $\rightarrow r^{x-x^2} > 1 \rightarrow \log_r r^{x-x^2} > \log_r 1$

$r^{x-x^2} > 1 \rightarrow -x^2 + x > 0 \rightarrow x(1-x) > 0 \rightarrow 0 < x < 1$

$\rightarrow D_f = [1, 1)$

ب) $y = \left(\frac{rk + \omega}{rk + r} \right) ! \rightarrow \frac{rk + \omega}{rk + r} \in \omega \Rightarrow \frac{rk - \omega}{rk - r} = x$

$D_f = \left\{ x \mid x = -\frac{rk - \omega}{rk - r}, k \in \omega \right\}$

دالة

دالة