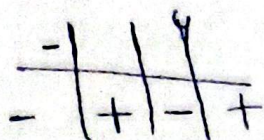


الف) $y = \sqrt{\frac{u^2 - 4u}{u^3 - u}}$



$u^3 - u > 0 \Rightarrow u^2(u-1) > 0$

$u^2 - 4u > 0 \Rightarrow u(u-4) > 0$

$u^2(u-1) > 0 \Rightarrow u > 1$

ب) $\sqrt{\frac{u^2 - u^2}{u^3 - u}} \Rightarrow \frac{u^2 - u^2}{u^3 - u} \geq 0$

$\frac{u^2(u^2 - 1)}{u(u^3 - u)} \Rightarrow \frac{u^2(u^2 - 1)}{u(u^2 - 1)(u + 1)}$

$P_D \rightarrow (-1, 0) \cup (0, 1) \cup [4, +\infty)$

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الف) $y = \frac{u+1}{\sqrt{u+|u|}}$

$u+|u| > 0$

$|u| > -u \Rightarrow P_D \rightarrow (0, +\infty)$

$u+|u| > 2u \Rightarrow u > 0$

ب) $y = \frac{1}{\sqrt{u|u|}}$

$u|u| > 0 \Rightarrow u > 0$

$u|u| > u^2 \Rightarrow u > 0$

$P_D \rightarrow (0, +\infty)$

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الف) $y = \sqrt{2-|u|}$

$2-|u| \geq 0$

$|u| \leq 2$

$u < 2$

$P_D \rightarrow (-\infty, 2)$

ب) $y = \frac{1}{\sqrt{2-|u|}}$

$2-|u| > 0$

$|u| < 2$

$P_D \rightarrow (-\infty, 2)$

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الف) $\sqrt{\left[m - \frac{1}{r}\right] + \left[m + \frac{r}{r}\right]}$

$\left[m - \frac{1}{r}\right] + \left[m + \frac{r}{r}\right] \geq 0$

$\frac{1}{r} \leq m < 1$

$P_D \rightarrow \left[\frac{1}{r}, +\infty\right)$

ب) $\sqrt{\left[m - \frac{1}{r}\right] + \left[-m + \frac{1}{r}\right]}$

$a = m - \frac{1}{r}$

$\{a\} + \{-a\} = 0$

$m = \frac{1}{r} + k \quad k \in \mathbb{Z}$

$P_D \rightarrow \left\{\frac{1}{r} + k \mid k \in \mathbb{Z}\right\}$

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الف) $y = \frac{r}{\sin u - 1}$

$\sin u - 1 \neq 0$

$\sin u \neq 1$

$P_D \rightarrow \mathbb{R} - \left\{\frac{\pi}{r} + 2k\pi\right\}$

ب) $y = \frac{r}{r \sin^2 u - 1}$

$r \sin^2 u - 1 \neq 0$

$\sin^2 u \neq \frac{1}{r}$

$\sin u \neq \pm \sqrt{\frac{1}{r}}$

$P_D \rightarrow \mathbb{R} - \left\{\frac{\pi}{r} + \frac{2k\pi}{r}\right\}$

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$$\text{الف) } y = \sqrt{r \sin m - 1}$$

$$r \sin m - 1 \geq 0$$

$$\sin m \geq \frac{1}{r}$$

$$D_f = \left[\frac{\pi}{4} + 2k\pi, \frac{3\pi}{4} + 2k\pi \right]$$

$$\text{ب) } y = \sqrt{\cos m - 1}$$

$$\cos m - 1 \geq 0$$

$$\cos m \geq 1 \Rightarrow m = 2k\pi$$

$$D_f = \{2k\pi\}$$

$$\text{الف) } y = |m| - r$$

$$[-1, 1]$$

$$-1 \leq |m| - r \leq 1$$

$$r \leq |m| \leq r + \varepsilon \Rightarrow -r - \varepsilon \leq m \leq -r$$

$$D_f = [-r - \varepsilon, -r] \cup [r, r + \varepsilon]$$

$$\text{ب) } y = \arcsin(m^2 + r m + 1)$$

$$-1 \leq m^2 + r m + 1 \leq 1$$

$$m^2 + r m + 1 \geq 0 \Rightarrow m \leq -r$$

$$(m+1)(m+r) \geq 0 \Rightarrow m \geq -1$$

$$\Leftrightarrow -r \leq m \leq -1$$

$$D_f = [-r, -1] \cup [-1, 0]$$

$$\text{الف) } y = \sqrt{r - \log_r(m-r)}$$

$$m-r > 0 \quad r - \log_r(m-r) \geq 0$$

$$m > 0$$

$$m-r \leq r^r \quad \log_r(m-r) \leq r$$

$$m \leq r \Rightarrow D_f = (r, r^r]$$

$$\text{ب) } y = \log(m^2 - m)$$

$$m < 0$$

$$m^2 - m > 0 \Rightarrow m(m-1) > 0$$

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

$$\text{الف) } y = \frac{r}{\varepsilon^m + 1}$$

$$\varepsilon^m > 0$$

$$\varepsilon^m + 1 > 0$$

$$D_f = \mathbb{R}$$

$$\text{ب) } y = \frac{r}{\varepsilon^m - 1}$$

$$m \neq 0$$

$$\Rightarrow D_f = \mathbb{R} - \{0\}$$

$$\varepsilon^m - 1 \neq 0$$

$$\varepsilon^m \neq 1$$

$$\varepsilon^m - r \neq 0$$

$$\varepsilon^m \neq r$$

$$m \neq \log_r \varepsilon = \frac{1}{r}$$

$$\text{ج) } y = \frac{r}{\varepsilon^m - r}$$

$$D_f = \mathbb{R} - \left\{ \frac{1}{r} \right\}$$

$$y = \frac{r}{\varepsilon^m - r} \Rightarrow \varepsilon^m = \frac{r}{y} + r$$

$$m \neq \log_r \left(\frac{r}{y} + r \right)$$

$$D_f = \mathbb{R} - \left\{ \log_r \left(\frac{r}{y} + r \right) \right\}$$

$$\text{الف) } y = (\varepsilon m + 1)!$$

$$\varepsilon m + 1 \geq n$$

$$D_f = \left\{ \frac{n-1}{\varepsilon} \mid n \in \mathbb{Z}_{\geq 0} \right\}$$

$$\text{ب) } y = \left(\frac{\varepsilon m - r}{\varepsilon m - 1} \right)!$$

$$\frac{\varepsilon m - r}{\varepsilon m - 1} \geq n$$

$$D_f = \left\{ \frac{\varepsilon m - r}{\varepsilon(m-1)} \mid m \in \mathbb{Z}_{\geq 0}, m \neq 1 \right\}$$