

الف) $x \sin y = y \sin x \rightarrow \begin{matrix} x=0 \\ \sin 0=0 \\ \sin x=0 \end{matrix} \rightarrow \begin{matrix} \text{مطلوب} \\ \text{مطلوب} \\ \text{مطلوب} \end{matrix} \rightarrow \begin{matrix} \text{مطلوب} \\ \text{مطلوب} \\ \text{مطلوب} \end{matrix}$

-V

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \xrightarrow{\text{مطلوب}} \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{x}{y} \cdot \frac{y}{x}} = 2$

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

$\frac{y}{x} \times \frac{x}{y} = 1$

$\frac{x^2 + y^2}{xy} = 2 \quad x^2 + y^2 = 2xy \Rightarrow x^2 + y^2 - 2xy = 0 \quad (x-y)^2 = 0 \Rightarrow x=y \checkmark$

مطلوب

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

$\frac{1}{+} \frac{2}{-} \frac{1}{+}$

$x \in (-\infty, 1] \cup (2, +\infty)$

$\frac{0}{-} \frac{2}{+} \frac{1}{-}$

$x \in (0, 2]$

-A

$x \in D_f \cap (0, 1]$

ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{2} \Rightarrow \sqrt{y-1} = \sqrt{2} - \sqrt{x} \xrightarrow{\text{مطلوب}} y-1 = 2 + x - \sqrt{2x}$

$y = x + 3 - \sqrt{2x}$

$x \geq 0 \quad y \geq 0$

$\sqrt{2} - \sqrt{x} \geq 0$

$\sqrt{2} \geq \sqrt{x}$

$2 \geq x$

$D_f = [0, 2]$

الف) $y = \frac{\sqrt{x^2 - 5x + 4}}{\sqrt{x - 10x + 14}} \rightarrow (x-4)(x-1)$

$\sqrt{x - 10x + 14} \rightarrow -9x + 14$

$\frac{1}{+} \frac{2}{-} \frac{1}{+}$

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

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$\frac{14}{-9} \frac{1}{+} \frac{1}{-} \quad x \in (-\infty, \frac{14}{9}) \quad x \in D_f \cap (-\infty, 1]$

ب) $\sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} \rightarrow (x-1)(x-4)$

$\sqrt{x^2 - 10x + 14} \rightarrow (x-1)(x-2)$

$\frac{1}{+} \frac{2}{-} \frac{1}{+} \frac{1}{-} \frac{1}{+}$

$D_f = (-\infty, 1] \cup (2, 4] \cup (1, +\infty)$

الف) $y = \frac{\sqrt{x^2 - 5x + 4}}{\sqrt{x^2 - 10x + 14}} < \frac{1}{\frac{1}{x}} = \frac{c}{a}$

$\frac{1}{+} \frac{2}{-} \frac{1}{+}$

$(-\infty, 1] \cup (\frac{4}{3}, +\infty)$

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$\frac{1}{+} \frac{2}{-} \frac{1}{+}$

$(-\infty, 1) \cup (\frac{4}{3}, +\infty)$

$\cap D_f \cap (-\infty, 1) \cup (\frac{4}{3}, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} < \frac{1}{\frac{1}{x}}$

$\frac{1}{+} \frac{2}{-} \frac{1}{+} \frac{1}{-} \frac{1}{+}$

$D_f \cap (-\infty, 1) \cup (1, \frac{4}{3}) \cup (\frac{4}{3}, +\infty)$