

الف) $y = x^2 - 5 \Rightarrow x = \sqrt{y+5} \Rightarrow R_f = [-5, +\infty)$

ب) $y = x^2 + 1 \Rightarrow x = \sqrt{y-1} \Rightarrow R_f = [1, +\infty)$

الف) $y = x^2 - 4x + 4 \Rightarrow y = (x-2)^2 \Rightarrow x = 2 \pm \sqrt{y} \Rightarrow R_f = [0, +\infty)$

ب) $y = x^2 - 2x + 1 \Rightarrow y = (x-1)^2 \Rightarrow x = 1 \pm \sqrt{y} \Rightarrow R_f = [0, +\infty)$

الف) $y = \frac{x^2 + 3}{x^2 - 2} \Rightarrow y(x^2 - 2) = x^2 + 3 \Rightarrow x^2(y-1) = y+3 \Rightarrow x = \pm \sqrt{\frac{y+3}{y-1}} \Rightarrow R_f = (-\infty, -1) \cup (1, +\infty)$

ب) $y = \frac{x^2 + 1}{x^2 - 4} \Rightarrow y(x^2 - 4) = x^2 + 1 \Rightarrow x^2(y-1) = y+4 \Rightarrow x = \pm \sqrt{\frac{y+4}{y-1}} \Rightarrow R_f = (-\infty, -1) \cup (1, +\infty)$

$y = \frac{1}{x^2 - 4x} \Rightarrow y(x^2 - 4x) = 1 \Rightarrow x^2 - 4x - \frac{1}{y} = 0 \Rightarrow x = 2 \pm \sqrt{4 + \frac{1}{y}} \Rightarrow R_f = (-\infty, -\frac{1}{4}] \cup (0, +\infty)$

$R_f = (-\infty, -\frac{1}{4}] \cup (0, +\infty)$

$y = x^2 - 4x + 2 \Rightarrow \min \begin{cases} x = \frac{4}{2} = 2 \\ y = -2 \end{cases} \Rightarrow R_f = [-2, +\infty)$

$y = -x^2 + 4x + 2 \Rightarrow \max \begin{cases} x = \frac{4}{2} = 2 \\ y = 6 \end{cases} \Rightarrow R_f = (-\infty, 6]$

الف) $y = \sqrt{x^2 - 4x + 4} \Rightarrow \min \begin{cases} x = \frac{4}{2} = 2 \\ y = 0 \end{cases} \Rightarrow R_f = [0, +\infty)$

ب) $y = \sqrt{-x^2 + 4x + 4} \Rightarrow \max \begin{cases} x = \frac{4}{2} = 2 \\ y = 4 \end{cases} \Rightarrow R_f = [0, 4]$

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Subject:

Year : Month : Day : ()

ا) $y = x^{\frac{1}{2}} + \frac{1}{x^{\frac{1}{2}}} + 1$ $R_f = R$

ب) $y = \sqrt{x^2 + 4x + 4} \Rightarrow \sqrt{(x+2)^2} = [0, +\infty)$

ج) $y = \frac{x+1}{x-2} = 1R - \left\{ \frac{1}{1} \right\} \Rightarrow R_f = 1R - \left\{ \frac{1}{1} \right\}$

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ب) $y = \sqrt{\frac{x+1}{x+2}} \cdot \sqrt{1R - \left\{ \frac{1}{1} \right\}} = [0, +\infty) - \left\{ \frac{1}{1} \right\}$

د) $y = \frac{x^2+1}{x-2} \begin{cases} x=2 \\ y=1 \end{cases}$

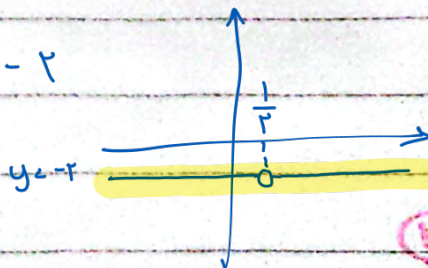


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ه) $y = \frac{x-2}{1-x} = \begin{cases} x=1 \text{ or } x=2 \\ y=-1 \end{cases}$

$y = \frac{x-2}{1-x} = \frac{1(1-x)}{1-x}$

$y = -1$



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و) $y = \cos^2 x + \frac{1}{\cos^2 x} = R_f = [1, +\infty)$

ز) $y = \sqrt{\frac{x^2+1}{x}} = \sqrt{x + \frac{1}{x}} \Rightarrow R_f = (-\infty, -1] \cup [1, +\infty)$

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