

کلیه معادلاتی که در دسترس است $V =$ شماره تکلیف

① $f(x) = \sqrt{x+4\sqrt{x-4}} \sim f(x) = \sqrt{x+4\sqrt{x-4}+4-4} \sim f(x) = \sqrt{(\sqrt{x-4}+2)^2} = \sqrt{x-4}+2$
 $g(x) = \sqrt{x-4\sqrt{x-4}+4-4} \rightarrow g(x) = \sqrt{(\sqrt{x-4}-2)^2} = \sqrt{x-4}-2$
 چون $x \geq 4$ پس $\sqrt{x-4} \geq 0$ است

$g(x) + f(x) = \sqrt{x-4} \quad \begin{cases} a=0 \\ b=1 \\ c=-4 \end{cases} \sim \frac{a+b}{c} = \frac{1}{-4} = -\frac{1}{4}$

② $f(x) = \frac{x+2}{x^2-4x+3} \quad f(x) = \left\{ (2, -4) \right\} \left(\frac{2}{3}, \frac{2}{3} \right) \left(0, \frac{2}{3} \right)$

$\frac{g}{f} \rightarrow \left\{ (2, \frac{1}{-4}) \right\} \left(\frac{2}{3}, \frac{4}{3} \right)$

③ الف - $f(x) = \left\{ \left(\frac{1}{x}, 2 \right) \right\} \left(\frac{3}{x}, -1 \right) \left(2, 2 \right) \left(-\frac{1}{x}, 2 \right)$

ب - $f(x^2) \rightarrow x^2-1 \rightarrow +1 \quad x^2-3 \rightarrow +\sqrt{3} \quad x^2-4 \rightarrow +2 \quad x^2=-1 \rightarrow$

$f(x^2) = \left\{ (1, 2) \right\} (-1, 2) (\sqrt{3}, -1) (-\sqrt{3}, -1) (2, 2) (-2, 2)$

ج - $g^2(x) \rightarrow \left\{ (1, 2, 4) \right\} (1, 1) (5, 4) (-1, 5) \rightarrow 2g^2(x) \rightarrow \left\{ (-2, 1, 8) \right\} (1, 2) (3, 8) (-1, 5)$

$2g^2(x) + 1 \rightarrow \left\{ (-2, 1, 9) \right\} (1, 2) (3, 9) (-1, 5)$

د - $2f \rightarrow \left\{ (1, 4) \right\} (5, -2) (5, 4) (-1, 12) \sim \frac{2f}{g} = \left\{ (1, \frac{4}{3}) \right\} \left(\frac{5}{3}, -\frac{2}{3} \right) \left(\frac{5}{3}, \frac{4}{3} \right) \left(-\frac{1}{3}, 4 \right) = \left\{ (1, -4) \right\} (5, -1)$

ه - $2f \rightarrow \left\{ (1, 2) \right\} (5, 2) (5, 18) (-5, 0) \quad g = \left\{ (1, 1) \right\} (3, 3) (-5, 4) (-1, 2) (5, 3)$

ه - $2f+g = \left\{ (2, 5) \right\} (8, 5) (-2, 4)$

④ $\frac{\sqrt{3x-x}}{x-2} \rightarrow \begin{cases} ① x-2 \neq 0 \rightarrow x \neq 2 \\ ② \sqrt{3x-x} \geq 0 \rightarrow 3x-x \geq 0 \rightarrow 2x \geq 0 \rightarrow x \geq 0 \end{cases} \quad D = [0, 3] - \{2\}$
 $\frac{1}{x-2} \rightarrow [0, 3]$

$[x] + [-x] + 1$

$x \in \mathbb{Z} \rightarrow -1 \neq$

⑤ $f(x) \rightarrow 2x-x^2-4 \geq 0 \sim x^2-2x+4 \leq 0 \quad (x-1)(x-4) = \frac{1}{x-1} \sim [1, 4]$

$g(x) = \left\{ (1, 2) \right\} (2, 2) (5, 4) (4, 1) \quad f(x) = \left\{ (1, 0) \right\} (2, 2) (5, 0)$

$\frac{f(x)}{g(x)} = \left\{ (1, \frac{0}{2}) \right\} \left(\frac{2}{2}, \frac{2}{2} \right) \left(\frac{5}{4}, \frac{0}{1} \right)$

٧) الف - $y = x^3 - 3x^2 + 3x \rightsquigarrow (x-1)^3 + 1$

$y-1 = (x-1)^3 \rightsquigarrow \sqrt[3]{y-1} = x-1 \rightsquigarrow \sqrt[3]{y-1} + 1 = x \rightsquigarrow P_f = \mathbb{R}$

ب) $yx' - 2xy = 1 \rightsquigarrow yx' - 2xy - 1 = 0$ $\frac{y \pm \sqrt{4y^2 + 4y}}{2y} \rightsquigarrow y' - 2y \geq 0 \rightsquigarrow \frac{y'}{y} \geq \frac{1}{y+1}$
 $y \neq 0 \rightsquigarrow \frac{1}{y} \geq \frac{1}{y+1}$

$\frac{1}{y} \geq \frac{1}{y+1} \rightsquigarrow \frac{1}{y} - \frac{1}{y+1} \geq 0 \rightsquigarrow \frac{1}{y(y+1)} \geq 0$

٨) الف - $\frac{-b}{2a} = 2 \rightsquigarrow x-1+1 = 4 \rightsquigarrow a > 0 \rightsquigarrow P_f = [4, +\infty)$

ب) $a < 0 \rightsquigarrow \frac{-b}{2a} = 2 \rightsquigarrow -9 + 18 + 3 = 12 \rightsquigarrow P_f = (-\infty, 12]$

ج) $a > 0 \rightsquigarrow \frac{-b}{2a} = 2 \rightsquigarrow x-1-3 = -5 \rightsquigarrow P_f = [5, +\infty)$
 غلط ارجاع

د) $a < 0 \rightsquigarrow \frac{-b}{2a} = 2 \rightsquigarrow -9 + 3 = -6 \rightsquigarrow 18 - 9 = 9 \rightsquigarrow P_f = (-\infty, 9] \rightsquigarrow P_f = [0, 3]$

٩) الف) $P_f = \mathbb{R}$ $\frac{1}{x} \geq \frac{1}{x+1}$
 ب) $P_f = \mathbb{R}$

ج) $\sqrt{x^2 - 4x^2 + 4x + 1} \rightsquigarrow P_f = [0, +\infty)$

د) $(x^2 - 4x^2 + 4x + 1) \rightsquigarrow P_f = [0, +\infty)$

١٠) الف) $P_f = \{3\}$

ب) $P_f = \{1\}$