

"A" $\frac{1}{2}$ $\frac{1}{2}$

"V" $\frac{1}{2}$ $\frac{1}{2}$

"A" $\frac{1}{2}$ $\frac{1}{2}$

$$\sqrt{a+k}\sqrt{a-k} + \sqrt{a-k}\sqrt{a-k} = a+b\sqrt{a+c} \Rightarrow \sqrt{(\sqrt{a-k}+r)^2} + \sqrt{(\sqrt{a-k}-r)^2} = a+b\sqrt{a+c}$$

$$|\sqrt{a-k}+r| + |\sqrt{a-k}-r| = a+b\sqrt{a+c} \xrightarrow{\text{و}} \sqrt{a-k}+r + \sqrt{a-k}-r = a+b\sqrt{a+c}$$

$$r\sqrt{a-k} = a+b\sqrt{a+c} \Rightarrow \begin{cases} c = -k \\ b = r \\ a = 0 \end{cases} \Rightarrow \frac{a+b}{c} = \frac{0+r}{-k} = \left(\frac{-r}{k}\right)$$

$$m^2 - km + k^2 \neq 0 \Rightarrow (m-1)(m-k) = 0 \Rightarrow m \xrightarrow{1, k} \Rightarrow D_f = \{R - \{1, k\}\}$$

$$D_g = \{1, k, 0\} \Rightarrow \frac{g}{f} = D_g \cap D_f = \{x | f(x) \neq 0\} \Rightarrow \{1, 0\} - \{1, k\} = \{1, 0\}$$

د) $f(m) \rightarrow m=1 \Rightarrow m=\frac{1}{r}$
 $\rightarrow rm = k \Rightarrow m = \frac{k}{r}$
 $\rightarrow rm = r \Rightarrow m = 1$
 $rm = -1 \Rightarrow m = -\frac{1}{r}$

د) $f(m^r) \rightarrow m^r = 1 \Rightarrow m = \pm 1$
 $\rightarrow m^r = k \Rightarrow m = \pm \sqrt[k]{k}$
 $\rightarrow m^r = -1 \Rightarrow m = \pm \sqrt[k]{-1}$

ج) $rg^r(m) + 1 \rightarrow g(1) = -1 \Rightarrow k$
 $\rightarrow g(k) = r \Rightarrow 9$
 $\rightarrow g(-1) = 0 \Rightarrow 1$

د) $\frac{rf}{g}$
 $f(m) = \{(\frac{1}{r}, 1), (\frac{k}{r}, 1), (1, 9), (-\frac{1}{r}, 0)\}$
 $g(m) = \{(1, 2), (k, -1), (9, 9), (-1, 4)\}$

$f(m) = \{(\frac{1}{r}, 1), (\frac{k}{r}, 1), (1, 9), (-\frac{1}{r}, 0)\}$
 $g(m) = \{(1, 2), (k, -1), (9, 9), (-1, 4)\}$
 $\Rightarrow h(m) = \{(1, 2), (k, -1), (9, 9), (-1, 4)\}$

$f(m) = \frac{\sqrt{a+m}-m}{m-r}$
 $\begin{cases} \text{I } km \geq 0 \Rightarrow m \geq 0 \\ \text{II } \sqrt{a+m}-m \geq 0 \Rightarrow \sqrt{a+m} \geq m \Rightarrow km \geq m^2 \Rightarrow \frac{m^2-km}{m(m-k)} \leq 0 \Rightarrow \frac{m}{m-k} \leq 0 \Rightarrow m \leq k \\ \text{III } m-r \neq 0 \Rightarrow m \neq r \end{cases}$

$\Rightarrow D_f = [0, k] - \{r\} \cup [0, r) \cup (r, k]$
 $\rightarrow m \in \mathbb{Z} \Rightarrow g(m) = 0 \Rightarrow \left(\frac{f}{g+1}\right)(m) \Rightarrow f(m) \checkmark$
 $\rightarrow m \notin \mathbb{Z} \Rightarrow g(m) = -1 \Rightarrow \left(\frac{f}{g+1}\right)(m) \Rightarrow \left(\frac{f}{0}\right)(m) \rightarrow \infty$
 $\Rightarrow D_{\frac{f}{g+1}} = [0, k] - \{r\}$

حل) $m^2 - 1m + 1m - 1 + 1 \Rightarrow (m-1)^2 = y \Rightarrow m-1 = \sqrt{y} \Rightarrow m = \sqrt{y} + 1 \Rightarrow R_f = \mathbb{R}$

ج) $yx^2 - 2xy - 1 = 0 \rightarrow m = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} = \frac{2y \pm 2\sqrt{y(y+1)}}{2y} \Rightarrow y \pm \sqrt{y(y+1)}$
 $R_f = (-\infty, -1] \cup (0, +\infty)$
 ملاحظات: $y = 0 \Rightarrow m = 1$
 $y = -1 \Rightarrow m = 0$
 $y > 0 \Rightarrow m > 1$
 $y < -1 \Rightarrow m < 0$

حل) $f(m) = \sqrt{am - m^2 - 1} \Rightarrow m^2 - am + 1 \leq 0 \Rightarrow (m-1)(m-1) \leq 0$
 $g(m) = \{ (1, 1), (2, 2), (3, 3), (4, 4) \} \Rightarrow D_g = \{1, 2, 3, 4\}$
 $D_f \cap D_g = \{m \mid g(m) = 0\} \Rightarrow \{1, 2, 3\} \Rightarrow h(m) = \{ (1, 0), (2, 0), (3, 0) \}$
 $f(m) = [1, 4]$

حل) $\rightarrow \frac{-b}{1a} = m_s = \frac{K}{V} = 2 \Rightarrow y_s = 2 - 1 + 1 = 2 \Rightarrow R = [2, +\infty)$

ج) $m_s = \frac{-b}{1a} = \frac{-4}{-1} = 4 \Rightarrow y_s = -4 + 1 + 4 = 1 \Rightarrow (-\infty, 1] = R_f$

ح) $m_s = \frac{-b}{1a} = \frac{K}{V} = 2 \Rightarrow y_s = 2 - 1 - 2 = -1 \Rightarrow \sqrt{[-1, +\infty)} \Rightarrow R_f = [0, +\infty)$

د) $m_s = \frac{-b}{1a} = \frac{-4}{-1} = 4 \Rightarrow y_s = 1 - 4 = -3 \Rightarrow \sqrt{(-\infty, 4]} \Rightarrow R_f = [0, 4]$

حل) $\mathbb{R} = R_f$ ج) $R_f = \mathbb{R}$ ح) $\sqrt{\mathbb{R}} \Rightarrow R_f = [0, +\infty)$ د) $R_f = \mathbb{R}$

حل) $y = \frac{m+1}{m-1} \xrightarrow{ad \neq bc} \mathbb{R} - \{ \frac{a}{c} \} = \mathbb{R} - \{ 1 \}$

ج) $y = \frac{m+1}{m+1} \xrightarrow{ad \neq bc} \mathbb{R} - \{ \frac{a}{c} \} = \mathbb{R} - \{ 1 \}$