

"A" در صورتی که

"B" در صورتی که

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مشتق

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

$$|\sqrt{x-k}+k| + |\sqrt{x-k}-k| = a+b\sqrt{x+c} \xrightarrow{\text{از ۱}} \sqrt{x-k}+k + \sqrt{x-k}-k = a+b\sqrt{x+c}$$

$$2\sqrt{x-k} = a+b\sqrt{x+c} \Rightarrow \begin{cases} c = -k \\ b = 2 \\ a = 0 \end{cases} \Rightarrow \frac{a+b}{c} = \frac{0+2}{-k} = \left(\frac{-2}{k}\right) \quad \text{پ}$$

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

$D_g = \{x \mid x^2+k=0\} \Rightarrow \left(\frac{g}{f}\right) = D_g \cap D_f = \{x \mid f(x) \neq 0\} \Rightarrow \{x \mid x \neq 1, k\} = \{x \mid x \neq 1\} \quad \text{پ}$

$\frac{g}{f} = \left(\frac{x^2-k}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right) \quad \text{پ}$

د) $f(x) \rightarrow x=1 \Rightarrow x=\frac{1}{x}$
 $\rightarrow x=k \Rightarrow x=\frac{k}{x}$
 $\rightarrow x=-1 \Rightarrow x=-\frac{1}{x}$

د) $f(x^2) \rightarrow x^2=1 \Rightarrow x=\pm 1$
 $\rightarrow x^2=k \Rightarrow x=\pm\sqrt{k}$
 $\rightarrow x^2=-1 \Rightarrow \text{جواب ندارد}$

ج) $2g(x)+1 \rightarrow g(1)=1 \Rightarrow x$
 $\rightarrow g(k)=2 \Rightarrow x$
 $\rightarrow g(-1)=0 \Rightarrow x$

$\Rightarrow 2g(x)+1 = \left(\frac{2x^2-1}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right)$

$\Rightarrow \frac{2f}{g}$

$f(x) = \left(\frac{x^2-1}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right)$
 $g(x) = \left(\frac{x^2-k}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right)$

$\Rightarrow \frac{2f}{g} = \frac{2(x^2-1)}{x^2-k} \xrightarrow{x=1} \frac{2(1-1)}{1-k} = 0$
 $\rightarrow x=k \Rightarrow \frac{2(k^2-1)}{k^2-k} = \frac{2(k-1)(k+1)}{k(k-1)} = \frac{2(k+1)}{k}$
 $\rightarrow x=-1 \Rightarrow \frac{2(1-1)}{1-k} = 0$

$f(x) = \left(\frac{x^2-1}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right)$
 $g(x) = \left(\frac{x^2-k}{x^2-kx+k}\right) \left(\frac{1}{x-1}\right)$

$\Rightarrow h(x) = \left(\frac{x^2-1}{x^2-k}\right) \left(\frac{1}{x-1}\right)$

$\Rightarrow h = 2f + g \xrightarrow{x=k} \frac{2(k^2-1)}{k^2-k} = \frac{2(k+1)}{k}$
 $\xrightarrow{x=-1} \frac{2(1-1)}{1-k} = 0$

$f(x) = \frac{\sqrt{x^2-k}-x}{x-k}$

I $x \geq 0 \Rightarrow x \geq 0$
 II $\sqrt{x^2-k}-x \geq 0 \Rightarrow \sqrt{x^2-k} \geq x \Rightarrow x^2-k \geq x^2 \Rightarrow -k \geq 0 \Rightarrow k \leq 0$
 III $x-k \neq 0 \Rightarrow x \neq k$

$\Rightarrow D_f = [0, k] - \{k\} \cup (k, \infty)$

$g(x) = [x] + [-x] \Rightarrow D_g = \mathbb{R}$

$\Rightarrow D_{\frac{f}{g}} = [0, k] - \{k\} \cup (k, \infty)$

قرار بردن حاصل قسوه با شونده!

الف) $m^2 - 1m + 1m - 1 + 1 \Rightarrow (m-1) = y \Rightarrow m-1 = \sqrt[3]{y} \Rightarrow m = \sqrt[3]{y} + 1$ (4)

ب) $yx^2 - 2xy - 1 = 0 \rightarrow m = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} = \frac{2y \pm 2\sqrt{y(y+1)}}{2y} \rightarrow y \pm \sqrt{y(y+1)}$ (5) $R_f = \mathbb{R}$

$R_f = (-\infty, -1] \cup (0, +\infty)$ (6) $y \pm \sqrt{y(y+1)}$

ف) $f(m) = \sqrt{am - m^2 - 2} \rightarrow m^2 - am + 2 \leq 0 \Rightarrow (m-1)(m-4) \leq 0$ (7) $f(m) = [1, 4]$

گ) $g(m) = \{ (1, 1), (2, 2), (3, 4), (4, 1) \} \Rightarrow D_g = \{1, 2, 3, 4\}$

$D_f \cap D_g = \{m | g(m) = 0\} \Rightarrow \{1, 2, 3, 4\} \Rightarrow h(m)$

$\begin{matrix} \rightarrow m=1 \rightarrow \frac{0}{1} = 0 \\ \rightarrow m=2 \rightarrow \frac{1}{2} = 1 \\ \rightarrow m=3 \rightarrow \frac{0}{3} = 0 \end{matrix} \Rightarrow h(m) = \{(1, 0), (2, 1), (3, 0)\}$ (8)

الف) $\rightarrow \frac{-b}{1a} = m_s = \frac{1}{1} = 1 \Rightarrow y_s = 1 - 1 + 1 = 1 \Rightarrow R = [1, +\infty)$ (9)

ب) $m_s = \frac{-b}{1a} = \frac{-4}{-1} = 4 \Rightarrow y_s = -9 + 1 + 4 = -4 \Rightarrow (-\infty, 14] = R_f$ (10)

ج) $m_s = \frac{-b}{1a} = \frac{1}{1} = 1 \Rightarrow y_s = 1 - 1 - 1 = -1 \Rightarrow \sqrt{[-1, +\infty)} \Rightarrow R_f = [0, +\infty)$ (11)

د) $m_s = \frac{-b}{1a} = \frac{-4}{-1} = 4 \Rightarrow y_s = 1 - 4 = -3 \Rightarrow \sqrt{(-\infty, 9]} \Rightarrow R_f = [0, 3]$ (12)

الف) $\mathbb{R} = R_f$ ب) $R_f = \mathbb{R}$ ج) $\sqrt{\mathbb{R}} \Rightarrow R_f = [0, +\infty)$ د) $R_f = \mathbb{R}$ (13)

تصادف عبارت توان 2 دارد ناقص است! (14)

الف) $y = \frac{m+1}{m-1} \xrightarrow{ad \neq bc} R - \{ \frac{a}{c} \} = \mathbb{R} - \{ 1 \}$ (15)

ب) $y = \frac{m+1}{m+1} \xrightarrow{ad \neq bc} \mathbb{R} - \{ \frac{a}{c} \} = \mathbb{R} - \{ 1 \}$ (16)

$$Df = \mathbb{R} - \{1, 3\} \quad (x^2 - 4x + 3 \neq 0 \rightarrow x \neq 1, 3)$$

(1)

$$Df \cap Dg = \{1, 0\} \rightarrow \frac{g}{f} = \left\{ \left(1, -\frac{1}{x}\right), (0, 4) \right\}$$

$$f(x) = \frac{\sqrt{\sqrt{x} - x}}{x - 2} \rightarrow \begin{cases} x \neq 2 \\ x \geq 0 \end{cases} \quad (\sqrt{x}) \rightarrow Df = [-, 2] - \{2\} \quad (\infty)$$

$$\begin{cases} \sqrt{x} - x \geq 0 \rightarrow x \geq x^2 \rightarrow 0 \leq x \leq 1 \end{cases}$$

$$g(x) + 1 \neq 0 \rightarrow g(x) \neq -1 \rightarrow [x] + [-x] \neq -1 \rightarrow x \in \mathbb{Z}$$

$$D \frac{f}{g+1} = \left\{ Df \cap Dg, g(x) \neq -1 \right\} = \left\{ 0, 1, 3 \right\}$$

$\downarrow$
 $[-, 2] - \{2\} \cap \mathbb{Z}$