

$$\begin{aligned} f(m) &= \sqrt{(\sqrt{m-2}+2)^2} = |\sqrt{m-2}+2| \\ g(m) &= \sqrt{(\sqrt{m-2}-2)^2} = |\sqrt{m-2}-2| \end{aligned} \quad \left. \begin{array}{l} m \geq 1 \Rightarrow \text{مست} \\ \text{و} \end{array} \right\} \Rightarrow \sqrt{m-2} + \sqrt{m-2} = 2\sqrt{m-2} = \frac{a}{0} + \frac{b}{2} \sqrt{\frac{m}{-2}} + \frac{c}{-2}$$

$$\Rightarrow \frac{a+b}{c} = \frac{0+2}{-2} = -\frac{1}{1}$$

$$\begin{aligned} f(m) &= 0 \\ a=2 &\rightarrow \frac{2}{-1} = -2 \\ a=1 &\rightarrow \frac{1}{0} = \infty \\ m=3 &\rightarrow \frac{0}{0} = \infty \\ m=0 &\rightarrow \frac{0}{0} = \infty \end{aligned} \quad \Rightarrow \frac{g}{f} = \left\{ \left(2, -\frac{1}{2} \right) \left(0, \frac{2}{1} \right) \right\} \Rightarrow \left\{ \left(2, -\frac{1}{2} \right) \left(0, 2 \right) \right\}$$

الف) $m=1 \rightarrow n=\frac{1}{2}$ $m=2 \rightarrow n=\frac{2}{1}$ $m=3 \rightarrow n=\frac{3}{1}$ $m=-1 \rightarrow n=-\frac{1}{2}$	ب) $m^2=1 \rightarrow m=\pm 1$ $m^2=2 \rightarrow m=\pm\sqrt{2}$ $m^2=3 \rightarrow m=\pm\sqrt{3}$ $m^2=-1 \rightarrow m=\pm i$ $m^2=-2 \rightarrow m=\pm i\sqrt{2}$ $m^2=-3 \rightarrow m=\pm i\sqrt{3}$	ج) $x^2+1=19$ $x(-1)+1=3$ $x(2)+1=9$ $x(0)+1=0$	د) $f = \{(1, 2), (3, -2), (4, 2), (-1, 2)\}$ $\Rightarrow \frac{f}{g} = \{(1, -2), (3, -1)\}$ $(-1, 2)$
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$$\begin{aligned} h(2) &= 2f(2) + g(2) = 2+3=5 \\ h(3) &= 2f(3) + g(3) = 2+3=5 \\ h(-2) &= 2f(-2) + g(-2) = 0+4=4 \end{aligned} \quad h = \{(2, 5), (3, 5), (-2, 4)\}$$

$$\begin{aligned} f(m) &: m \geq 0 \\ a &\geq 0 \\ \sqrt{m-2} &\geq 0 \\ \sqrt{m} &\geq 2 \\ m &\geq 4 \\ m-2 &\geq 0 \\ m &\geq 2 \end{aligned} \quad \Rightarrow D_f = [0, 3] - \{2\}$$

$$D_g = R \quad g(m)+1 \rightarrow$$

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$$\Rightarrow \{0, 1, 3\}$$

$f(x) = 0$ $x=1 \rightarrow 0$ $x=2 \rightarrow \sqrt{2}$ $x=3 \rightarrow 0$ $x=4 \rightarrow \sqrt{-1} \times$				$\Rightarrow h(x) = \{(1,0), (2, \sqrt{\frac{2}{3}}), (3,0)\}$	۶
الف) $y = x^3 - 3x^2 + 3x - 1 + 1$ $y = (x-1)^3 + 1$ $(x-1)^3 = y-1$ $x-1 = \sqrt[3]{y-1}$ $x = \sqrt[3]{y-1} + 1$ $\Rightarrow R = \mathbb{R}$		ب) $yx^3 - y^2x - 1 = 0$ $y \neq 0$ $x = \frac{y^2 \pm \sqrt{(-2y)^2 - 4(y)(-1)}}{2y}$ $\Rightarrow R = (-\infty, -1] \cup (0, +\infty)$ $xy^2 + xy \geq 0$ $xy(y+1) \geq 0$		۷	
الف) $\min \left \frac{b}{a} - \frac{2}{3} \right = \frac{2}{3}$ $\Rightarrow [4, +\infty)$	ب) $\max \left \frac{-4}{-9} - \frac{3}{11} \right = \frac{1}{11}$ $\Rightarrow (-\infty, 12]$	ج) $\min \left \frac{2}{-1} - \sqrt{2} \right $ $\Rightarrow \sqrt{2}$ $\Rightarrow [0, +\infty)$	د) $\max \left \frac{3}{9} - \sqrt{2} \right $ $\Rightarrow \sqrt{2}$ $\Rightarrow [0, 3]$	۸	
الف) $\Rightarrow R = \mathbb{R}$ برای هر قسمت های سوال	ب) $R = \mathbb{R}$	ج) $\sqrt{R}$ $\Rightarrow [0, +\infty)$	د) R^2 $\Rightarrow [0, +\infty)$	۹	
الف) $R - \{ \frac{9}{c} \}$ $\Rightarrow R - \{ 3 \}$		ب) $R - \{ \frac{9}{c} \}$ $= R - \{ 3 \}$		۱۰	