

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱/۱ کلاس: یازدهم سپهر اندیشه

۲. اثبات معادله کامل فورتی

$$f(m) + g(m) = A \Rightarrow f(m) \cdot g(m) : \sqrt{x+2}\sqrt{m-2} - \sqrt{x-2}\sqrt{m-2} = A$$

$$A^2 = x+2\sqrt{x-2} + x-2\sqrt{m-2} \Rightarrow 2\sqrt{(m+2)\sqrt{x-2}}(m-2\sqrt{x-2})$$

$$2x+2\sqrt{x^2-12(m-2)} = 2(m+\sqrt{(m-1)^2}) = 2(x+1)(m-1)$$

$$2(2x-1) = 4(m-1) = A^2 \Rightarrow A = \sqrt{4(m-1)} = 2\sqrt{m-1}$$

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

$$\frac{g}{f} \Rightarrow \left\{ \begin{pmatrix} 2 \\ -\frac{1}{2} \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} \begin{pmatrix} 2 \\ 0 \end{pmatrix} \begin{pmatrix} 0 \\ \frac{2}{3} \end{pmatrix} \right\}$$

$$\Rightarrow \frac{g}{f} = \left\{ \begin{pmatrix} 2 \\ -\frac{1}{2} \end{pmatrix} \begin{pmatrix} 2 \\ 0 \end{pmatrix} \right\}$$

$$\text{الف) } (2x) \Rightarrow \left\{ \begin{pmatrix} 1 \\ 2 \end{pmatrix} \begin{pmatrix} 2 \\ -1 \end{pmatrix} \begin{pmatrix} 2 \\ 2 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \end{pmatrix} \right\}$$

$$\text{ب) } (x^2) \Rightarrow \left\{ \begin{pmatrix} 1 \\ 2 \end{pmatrix} \begin{pmatrix} \sqrt{2} \\ -1 \end{pmatrix} \begin{pmatrix} -\sqrt{2} \\ -1 \end{pmatrix} \begin{pmatrix} 2 \\ 2 \end{pmatrix} \begin{pmatrix} -2 \\ 2 \end{pmatrix} \right\}$$

$$\text{ج) } 2g^2(x)+1 \Rightarrow \left\{ \begin{pmatrix} -2 \\ 19 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix} \begin{pmatrix} 2 \\ 9 \end{pmatrix} \begin{pmatrix} -1 \\ 1 \end{pmatrix} \right\}$$

$$\text{د) } \frac{2f}{g} \Rightarrow \left\{ \begin{pmatrix} 1 \\ -4 \end{pmatrix} \begin{pmatrix} 3 \\ -1 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \end{pmatrix} \begin{pmatrix} 2 \\ 0 \end{pmatrix} \right\}$$

$$h = \left\{ \begin{pmatrix} 1 \\ 5 \end{pmatrix} \begin{pmatrix} -2 \\ 4 \end{pmatrix} \begin{pmatrix} 2 \\ 5 \end{pmatrix} \right\}$$

$$D_{f \cdot g} = D_f \cap D_g = \{2, 5, -2\}$$

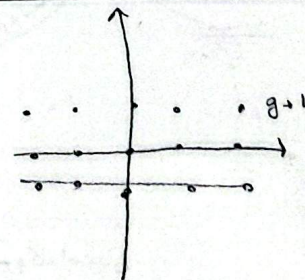
$$D^3 x \geq 0 \quad (2) \quad x-2 \geq 0 \quad x \leq 2 \Rightarrow 0 \leq x \leq 2 - \{2\}$$

$$1 \sqrt{x(x-1)} \geq 0 \quad x^2 \leq 2x$$

$$D\left(\frac{f}{g+1}\right) = D_f \cap D(g+1) - \{R-R\} - \{2\}$$

$$\hookrightarrow D\left(\frac{f}{g+1}\right) = \{x \mid x \in R, 0 \leq x \leq 2\}$$

$$\hookrightarrow x \in \{0, 1, 2\}$$



6	$h(x) = \frac{\sqrt{ax - x^2 - r}}{g(x)} \Rightarrow ax - x^2 - r \geq 0 \Rightarrow -x^2 + ax - r \geq 0$ $D_f = [1, 4]$ $D_g = \{1, r, r, a\}$ $\Rightarrow h(x) = \left\{ (1, 0), (r, \frac{\sqrt{r}}{r}), (4, \frac{1}{r}) \right\}$
7	$\text{الف) } y = x^3 - 2x^2 + 2x - 1 + 1 \Rightarrow (x-1)^3 = y-1 \Rightarrow x-1 = \sqrt[3]{y-1}$ $x = 1 + \sqrt[3]{y-1} \quad R_f = \mathbb{R}$ $\text{ب) } yx^2 - 2x = -1 \Rightarrow 2y \neq \sqrt{4y - 4y} = 1 + \frac{\sqrt{y^2 - y}}{y} \quad y^2 - y \geq 0$ $y \geq 0 \quad y > 0 \quad y < -1 \quad R_f = (-\infty, -1] \cup (0, \infty)$
8	$\text{الف) } x^2 - 2x + 1 = 0 \Rightarrow g(x-1)^2 + y \quad R_f = [0, \infty)$ $\text{ب) } y = -x^2 + 2x + 3 \Rightarrow R_f \in (-\infty, 4]$ $\text{ج) } y = x^2 - 2x - 3 \Rightarrow y = x^2 - 2x + 1 - 4 \Rightarrow y = (x-1)^2 - 4 \Rightarrow R_f = [-4, \infty)$ $\text{د) } y = \sqrt{2x + x^2} \quad R_f = [0, \infty)$
9	$\text{الف) } = 1 \quad \checkmark$ $\text{ب) } = 1 \quad \checkmark$ $\text{ج) } [0, \infty) \quad \checkmark$ $\text{د) } [0, \infty) \quad \checkmark$
10	$\text{الف) } R_f = \mathbb{R} - [r]$ $\text{ب) } R_f = \mathbb{R} - [r]$