

الف $f(x) = x^2 - 2x + 2 \rightarrow$ x را به y تبدیل $\rightarrow$ ب $f(x) = x^2 - 2x + 2 \rightarrow$ ج $f(x-1) \rightarrow$ x را به y تبدیل $\rightarrow$ د $-f(x) \rightarrow$ x را به y تبدیل $\rightarrow$	 	۱
الف $x^2 - 5x + 4 > 0 \Rightarrow (x-2)(x-4) > 0$ ب $x^2 - 4x + 5 < 0 \Rightarrow (x-1)(x-5) < 0$ ج $x^2 + 4x + 5 > 0 \Rightarrow (x+1)(x+5) > 0$ د $x^2 - 7x + 4 < 0 \Rightarrow (x-1)(x-4) < 0$	$x < 2$ یا $x > 4$ $\rightarrow$ $D_f = (-\infty, 2) \cup (4, \infty)$ $1 < x < 5$ $\rightarrow$ $D_f = (1, 5)$ $x \leq -5$ یا $x \geq -1$ $\rightarrow$ $D_f = (-\infty, -5] \cup [-1, \infty)$ $1 \leq x \leq 4$ $\rightarrow$ $D_f = [1, 4]$	۲
الف $\frac{x^2 - 5x + 4}{x - 5} < 0$ $\rightarrow$ $\frac{(x-2)(x-4)}{x-5} < 0$ ب $\frac{x^2 - 1}{x^2 - 4x + 5} > 0$ $\rightarrow$ $\frac{(x-1)(x+1)}{(x-1)(x-5)} > 0$	$x < 2$ یا $4 < x < 5$ $\rightarrow$ $D_f = (-\infty, 2) \cup (4, 5)$ $x > 5$ یا $x \leq -1$ $\rightarrow$ $D_f = (-\infty, -1] \cup (5, +\infty)$	۳
الف $y = \sqrt{\frac{x^2 - 1}{x^2 - x}} \rightarrow \frac{x^2 - 1}{x^2 - x} > 0$ $\rightarrow \frac{(x-1)(x+1)}{x(x-1)(x+1)} > 0$ ب $y = \sqrt{\frac{x^2 - 4}{x^2 - 5x + 2}} \Rightarrow \frac{(x-2)(x+2)}{(x-1)(x-2)} > 0$ $\Rightarrow x \neq 1, x \neq 2$	$x < -1$ یا $1 < x < 2$ یا $x > 2$ $\rightarrow$ $D_f = (-\infty, -1) \cup (1, 2) \cup (2, +\infty)$ $x > 2$ یا $x \leq -1$ $\rightarrow$ $D_f = (-\infty, -1] \cup (2, +\infty)$	۴
الف $y = \sqrt{2 - \sqrt{2 - x}} \Rightarrow 2 - \sqrt{2 - x} \geq 0$ $\rightarrow \sqrt{2 - x} \leq 2$ $\rightarrow 2 - x \leq 4$ $\rightarrow x \geq -2$ ب $y = \sqrt{2 - \sqrt{x - 2}} \Rightarrow x - 2 \geq 0$ $\rightarrow x \geq 2$	$D_f = [-2, 2]$ $D_f = [2, 11]$	۵

$\hookrightarrow y = \sqrt{2-r^2} \Rightarrow 2-r^2 \geq 0 \quad r^2 \leq 2 \quad -\sqrt{2} \leq r \leq \sqrt{2} \quad D_f = [-\sqrt{2}, \sqrt{2}]$	6
$\hookrightarrow y = \sqrt{ m -1} \Rightarrow r m -1 \geq 0 \quad r m \geq 1 \quad m \geq \frac{1}{r} \quad m \leq -\frac{1}{r} \vee m \geq \frac{1}{r}$ $D_f = (-\infty, -\frac{1}{r}) \cup (\frac{1}{r}, \infty)$	7
$\hookrightarrow y = \sqrt{\frac{ m +1}{ m -1}} \Rightarrow \frac{ m +1}{ m -1} \geq 0 \quad m -1 \neq 0 \quad m \neq 1 \rightarrow m \neq \pm 1 \quad D_f = \mathbb{R} - \{-1, 1\}$ $\hookrightarrow y = \sqrt{\frac{r m +1}{r m -1}} \Rightarrow \frac{r m +1}{r m -1} \geq 0 \quad r m -1 \neq 0 \rightarrow r m \neq 1 \rightarrow m \neq \pm \frac{1}{r}$ $D_f = (-\infty, -\frac{1}{r}) \cup (\frac{1}{r}, \infty)$	8
$\hookrightarrow y = \frac{2 \cos m}{1 + \cos m} \Rightarrow r \cos m - 1 \neq 0 \quad \cos m \neq \frac{1}{r} \quad D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2} : k \in \mathbb{Z}\}$ $\hookrightarrow y = \frac{\cos m + 1}{1 + \sin m} \Rightarrow r \sin m + 1 \neq 0 \quad \sin m \neq -\frac{1}{r} \quad D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2}\}$ $\hookrightarrow y = \frac{\tan m + r}{1 + \tan m} \Rightarrow m \neq k\pi + \frac{\pi}{2} \quad m \neq k\pi \quad \Leftrightarrow \cot m \neq 0 \quad \cot m \neq 1 \quad m \neq k\pi + \frac{\pi}{2}$ $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2}\}$ $\hookrightarrow y = \frac{\sin m + 1}{1 + \sin m} \Rightarrow \frac{\sin m + 1}{1 + \sin m} \geq 0 \quad \sin m \neq -1 \quad \sin m \neq \pm \frac{1}{r} \quad m \neq \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}, \dots$ $D_f = \mathbb{R} - \{\pm \frac{\pi}{2} + k\pi : k \in \mathbb{Z}\}$	9
$y = \frac{1}{\sqrt{r m-1 - \frac{1}{r}}} \Rightarrow r m-1 - \frac{1}{r} > 0 \quad r m-1 > \frac{1}{r} \quad m-1 > \frac{1}{r^2}$ $m-1 < -\frac{1}{r^2} \quad \vee \quad m-1 > \frac{1}{r^2} \Rightarrow m < 1 - \frac{1}{r^2} \quad \vee \quad m > 1 + \frac{1}{r^2}$ $D_f = (-\infty, 1 - \frac{1}{r^2}) \cup (1 + \frac{1}{r^2}, \infty)$	10
$\hookrightarrow y = \sqrt{2-r m } \Rightarrow 2-r m \geq 0 \quad m \leq \frac{2}{r} \quad D_f = [-\frac{2}{r}, \frac{2}{r}]$ $\hookrightarrow y = \sqrt{\frac{ m }{ m +1}} \Rightarrow \frac{ m }{ m +1} \geq 0 \quad m \neq 0 \quad D_f = \mathbb{R} - \{0\}$	11