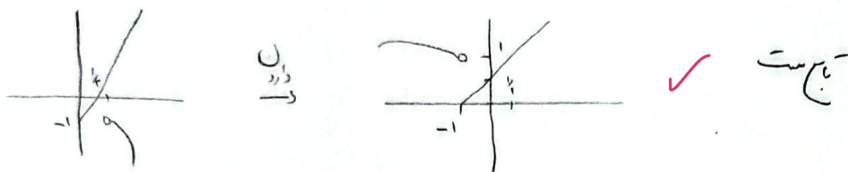


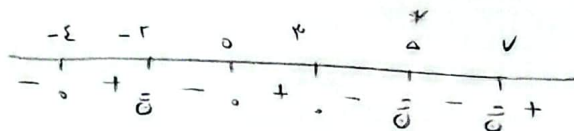
«مسئله برداری» ۲۰ - شماره تکلیف (2) درازم رفتند B

$$x = \begin{cases} x^2 - 1 & y > 0 \\ -x^2 & y < 0 \end{cases} \quad y = \begin{cases} x^2 - 1 & x > 0 \\ -x^2 & x < 0 \end{cases}$$

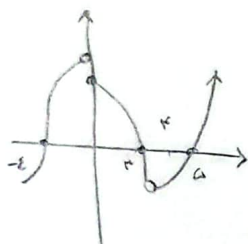
(r) 1



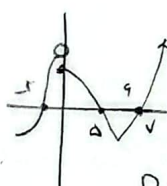
$$D_{f \circ g} = \mathbb{R} - \{ \pm 1 \}$$



(r) 2



$f \circ g(x)$



$$D_f = [-1, 1] \cup (1, +\infty)$$

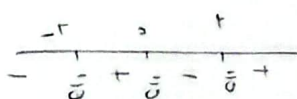
$$D_{f \circ g} = \mathbb{R} - \{ \pm 1 \}$$

$$f(x) = \frac{x^2 - 1}{x^2 - 2x}$$

$$\sqrt{\frac{x^2 - 1}{x^2 - 2x}} \rightarrow \Delta < 0 \Rightarrow \frac{x^2 - 1}{x^2 - 2x} < 0$$

(r) 3

$$x^2 - 2x \neq 0$$

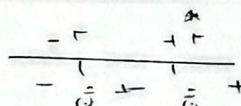


$$D_f = (-1, 0) \cup (1, +\infty)$$

$$D_f: \mathbb{R} - \{0, -1, 1\}$$

$$y = \sqrt{\frac{x-1}{x^2-2x}}$$

$$\frac{x-1}{x^2-2x} \geq 0$$



$$\hookrightarrow x^2 - 2x \geq 0 \rightarrow x(x-2) \geq 0 \rightarrow x \leq 0 \text{ or } x \geq 2$$

$$D_f = (-1, +\infty) - \{1\}$$

(r) 4

$$y = \frac{x^2 + 1}{x^2 - 2x}$$

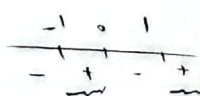
$$x^2 - 2x \neq 0$$

$$D_f = \mathbb{R} - \{0, 1\}$$

$$x^2 - 2x \neq 0 \rightarrow x(x-2) \neq 0 \rightarrow x \neq 0 \text{ and } x \neq 2$$

$$f(x) = \sqrt{\frac{x(x-1)}{|x|+1}}$$

$$\Rightarrow x(x-1) \geq 0$$



$$D_f = [1, +\infty)$$

$$|x|+1 > 0 \Rightarrow (x, +\infty)$$

(r) 5

$$f(x) = \sqrt{\frac{|x-1|-x^2}{|x|-1}}$$

$$\Rightarrow |x|-1 \neq 0 \rightarrow x \neq \pm 1$$

$$D_f = [-1, 1) - \{1\}$$

$$|x-1|-x^2 \geq 0 \Rightarrow -x^2 + x - 1 \geq 0 \Rightarrow x^2 - x + 1 \leq 0$$

$$\Delta = 1 - 4 = -3 < 0 \Rightarrow x^2 - x + 1 > 0 \text{ for all } x$$

$$y = \sqrt{(n-r)(-n-r)} \quad n < r$$

$$[n] = r \rightarrow r \leq n < r$$

$$\frac{r}{1} \quad \frac{r}{0} \quad \frac{r}{+}$$

$$D_f = (-\infty, +\infty) \checkmark$$

(r) 6

$$y = \sqrt{|n-1|[-n-r]}$$

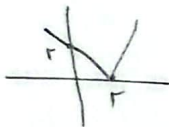
$$[n-r] =$$

$$[n] = -r \rightarrow r \leq n < r$$

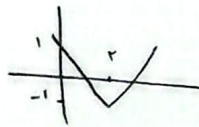
$$\frac{1^*}{-1} \quad \frac{r}{-1} \quad \frac{r}{0} \quad \frac{r}{+}$$

$$D_f = [r, +\infty) \cup \{1\} \checkmark$$

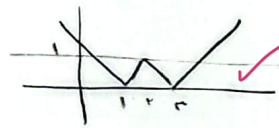
$$\frac{1}{|n-r|-1} \Rightarrow |n-r|-1 \neq k$$



$$|n-r|$$



$$|n-r|-1$$



$$|n-r|-1$$

$$y=1 \quad \checkmark \quad k=1$$

(r) 7

$$f_{1,2} = \frac{n^2 + rn + r}{n^2 + rn + r} \rightarrow n^2 + rn + r \neq 0 \rightarrow n \neq -1, -r$$

$$\frac{n+1}{n-1}$$

$$\frac{n+1}{n-1} \neq 0 \rightarrow n \neq -1$$

$$D_f = \mathbb{R} - \{-r, -1\}$$

(r) 8

$$n^2 - 4nn + 4n \rightarrow n^2 - 4n + 4 = 0 \rightarrow (n-2)^2 = 0 \rightarrow n=2$$

$$y = \log_{n+1} \frac{1}{n}$$

$$n > 0$$

$$n \neq 1$$

$$n+1 > 0 \rightarrow n > -1$$

$$n+1 \neq 1 \rightarrow n \neq 0$$

$$D_f = (0, 1) \checkmark$$

(r) 9

$$\frac{1}{n} > 0 \rightarrow n > 0$$

$$\frac{1}{n} > 0 \rightarrow n > 0$$

$$D_{f_{1,2}} = [-4, 2]$$

$$P_k(r^2-1) \rightarrow -4 \leq r^2-1 \leq 2 \quad \begin{cases} r^2 \leq 3 \rightarrow r \leq \sqrt{3} \rightarrow -\frac{\sqrt{3}}{r} \leq n \leq \frac{\sqrt{3}}{r} \\ r^2 \geq -3 \rightarrow \text{always true} \end{cases}$$

$$D_f(r^2-1) = \left[-\frac{\sqrt{3}}{r}, \frac{\sqrt{3}}{r}\right] \checkmark$$

(r) 10