

۲. آزمونهای نوشتاری

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تکلیف شماره ۵

امیررضا خدوون

$$\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \Rightarrow \frac{x^2+1-2x-x^2}{x(x-1)} \geq 0 \Rightarrow \frac{1-2x}{x(x-1)} \geq 0 \quad (1)$$

$$D = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$$

$$\frac{1}{x+1} - \frac{2}{x} = \frac{x-2x-2}{x(x+1)} = -\frac{x+2}{x(x+1)} \quad \text{صورت} \quad \frac{3}{x-1} + \frac{1}{x+2} = \frac{3x+6+x-1}{(x-1)(x+2)} = \frac{4x+5}{(x-1)(x+2)}$$

$$D = R - \left\{ -\frac{5}{4}, -\frac{5}{3} \right\} \quad \text{و} \quad x+2 \neq 0 \quad x \neq -2$$

$$\left(\left(\frac{1}{3}\right)^x - 9\right)(3^x - 4^x) \geq 0 \quad \frac{-2}{+\frac{5}{4}-\frac{5}{3}+} \quad D = (-\infty, -2] \cup \left[\frac{5}{4}, +\infty\right)$$

$$\sqrt[4]{x-1} + \sqrt{y+1} = 3$$

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

$$y+1 \geq 0 \Rightarrow y \geq -1$$

$$\sqrt{y+1} = 3 - \sqrt[4]{x-1}$$

$$3 - \sqrt[4]{x-1} \geq 0 \Rightarrow \sqrt[4]{x-1} \leq 3$$

$$D = [1, 12]$$

$$x-1 \leq 11$$

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

$$x^2 - x - 2 > 0$$

$$(x-2)(x+1) > 0 \quad \frac{-1}{+1-1+}$$

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

$$D = (-\infty, -1) \cup (1, +\infty)$$

$$3 + ax - x^2 = 0$$

$$-x^2 + ax + 3 = 0$$

$$x_1 = -2 \quad x_2 = b$$

$$-\frac{1}{2} + \frac{3}{2} = 1$$

$$a = -\frac{1}{2}$$

$$\text{جمع ریشه ها} = \frac{-a}{-1} = 1 \Rightarrow -2 + \frac{3}{2} = a$$

$$\frac{C}{A} = \text{حاصل ضرب ریشه ها} = \frac{3}{-1} = -3 \Rightarrow -2 \times b = -3 \Rightarrow b = \frac{3}{2}$$

$$x < 1$$

$$f(x) - x = 2x + 3 - x = x + 3$$

$$x + 3 \geq 0$$

$$x \geq -3$$

$$[-3, 1)$$

$$x > 1$$

$$f(x) - x = 2x - 2 - x = x - 2$$

$$x - 2 \geq 0$$

$$x \geq 2$$

$$[-3, 1) \cup [1, +\infty)$$

$$D = [-3, +\infty)$$

امیرضا حوزن - تکالیف شمار ۵ یازدهم ریاضی

$$f(n) = 2n^2 - 4n$$

$$f(\sin \frac{\pi}{2} + \cos \pi)$$

$$\sin \frac{\pi}{2} = \frac{\sqrt{3}}{2}$$

$$\cos \pi = -1$$

$$n = 1 + \frac{\sqrt{3}}{2}$$

$$\begin{aligned} f(n) &= 2\left(1 + \frac{\sqrt{3}}{2}\right)^2 - 4\left(1 + \frac{\sqrt{3}}{2}\right) \\ &= 2\left(\frac{1}{4} + \sqrt{3}\right) - 4 - 2\sqrt{3} = \frac{1}{2} + 2\sqrt{3} - 4 - 2\sqrt{3} \\ &= \boxed{-\frac{7}{2}} \end{aligned}$$

$$f(a) = \frac{a+1}{a-1}$$

$$a \in \mathbb{R} - \{1\}$$

$$\begin{aligned} f(f(a)) &= \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{a+1+a-1}{a-1} = \frac{2a}{a-1} \\ &\Rightarrow \frac{a+1-a+1}{a-1} = \frac{2}{a-1} \end{aligned}$$

$$a \neq 1 \quad f(f(a)) = \frac{2a}{a-1} \div \frac{2}{a-1} = a$$

$$g(a) = \sqrt{a^2 - 1}$$

$$(\sqrt{a^2 - 1})^2 - 4\sqrt{a^2 - 1} = -4$$

$$a^2 - 1 - 4\sqrt{a^2 - 1} = -4$$

$$t = \sqrt{a^2 - 1} \quad t^2 - 4t = -4 \quad t^2 - 4t + 4 = 0$$

$$(t-2)^2 = 0$$

$$t = 2$$

$$\sqrt{a^2 - 1} = 2 \quad a^2 - 1 = 4$$

$$a^2 = 5$$

$$a = \pm \sqrt{5}$$

$$f(x+3) = (x-3)(x-2)$$

$$x+3 = t \Rightarrow x = t-3$$

$$f(t) = (t-6)(t-5)$$

$$f(4) = -2 \times -1 = 2$$

$$f(-3) = -9 \times -1 = 9$$

$$2 \times 9 = 18$$

$$\tan^2 n = f(\cos n + \sin n)$$

$$\cos^2 n + \sin^2 n = 1$$

$$\cos n = t$$

$$t^2 + 0 = 1 \quad t = \pm 1$$

$$\sin^2 n = 1 - \cos^2 n = 1 - \frac{1}{4} = \frac{3}{4} \quad \tan^2 n = \frac{\sin^2 n}{\cos^2 n} = \frac{3}{1} = 3$$

$$t_1 = \frac{1}{3} = \frac{1}{3} \quad t_2 = \frac{-1}{3} = -\frac{1}{3}$$

$$t = \frac{-1 \pm \sqrt{1-3}}{2} = \frac{-1 \pm \sqrt{-2}}{2}$$