

کلاس یازدهم ریاضی

تکلیف شماره ۵

امیررضا خدوون

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

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

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

$$D = \mathbb{R} - \left\{-2, -\frac{1}{4}\right\} \quad \text{و } 4x+1 \neq 0 \quad x \neq -\frac{1}{4}$$

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

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

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

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

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

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

$$D = [1, 16] \quad x \leq 16$$

$$x-1 \leq 16$$

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

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

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

$$x^2 - 1 \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow x \geq 1 \text{ یا } x \leq -1$$

$$D = (-\infty, -1) \cup (2, +\infty)$$

مجموعه بازگشایی
ممنوع

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

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

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

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

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

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

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

$$x < 1$$

$$x > 1$$

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

$$x + 3 \geq 0$$

$$x \geq -3$$

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

$$x - 2 \geq 0$$

$$x \geq 2$$

$$[-3, 1)$$

$$[-3, 1) \cup [2, +\infty) \quad D = [-3, +\infty)$$

امیرضا حوزن - تکلیف شماره ۵ یازدهم ریاضی

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

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

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

$$\cos \pi = -1$$

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

$$f(n) = 2\left(1 + \frac{\sqrt{3}}{2}\right)^2 - 4\left(1 + \frac{\sqrt{3}}{2}\right)$$

$$= 2\left(\frac{1}{2} + \sqrt{3}\right) - 4 - 2\sqrt{3} = \frac{1}{2} + 2\sqrt{3} - 4 - 2\sqrt{3} = \boxed{-\frac{7}{2}}$$

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

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

$$f(f(a)) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} \Rightarrow \frac{a+1+a-1}{a-1} = \frac{2a}{a-1}$$

$$a \neq 1$$

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

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

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

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

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

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

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

$$t = 2$$

$$\sqrt{a^2 - 1} = 2 \quad a^2 - 1 = 4 \quad a^2 = 5$$

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

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

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

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

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

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

$$2 \times 9 = 18$$

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

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

$$t_1 = \frac{1}{13} = \frac{1}{13} \quad t_2 = \frac{-1}{13} = -\frac{1}{13}$$

$$n \cos = t$$

$$t = \frac{-1 \pm \sqrt{1 + 13}}{13} = \frac{-1 \pm 4}{13}$$

$$t^2 + 13t = 0 \quad 13t^2 + 13t - 12 = 0$$