

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۵۸... کلاس دهم دبیرستان.....

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

$$\frac{1-2x}{x(x-1)} \quad \begin{array}{c} 0 \\ + \quad - \quad + \quad - \end{array}$$

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

الف)

$$f(x) = \frac{1}{x+1} - \frac{2}{x} \rightarrow x \neq -1, 0$$

$$\frac{2}{x-1} + \frac{1}{x+2} \rightarrow \frac{x+2}{(x-1)(x+2)} \rightarrow x \neq -\frac{3}{2}, -2, 1$$

$$Df = \mathbb{R} \setminus \{-1, 0, 1, -\frac{3}{2}\}$$

ب)

$$f(x) = \sqrt{\left(\left(\frac{1}{x}\right)^x - 9\right)(3x - x^2)} \rightarrow 3x = x^2 \rightarrow x = 0, 3 \rightarrow x = \frac{3}{2}$$

$$\frac{-2}{+ \quad - \quad +}$$

$$Df = (-\infty, -2] \cup \left[\frac{3}{2}, +\infty\right)$$

الف)

$$\sqrt{x-1} + \sqrt{y+1} = 3 \quad x-1 \geq 0 \quad y+1 \geq 0$$

$$\sqrt{y+1} = 3 - \sqrt{x-1} \quad x \geq 1$$

$$Df = [1, 18]$$

ب)

$$f(x) = \frac{\log_2(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} \quad x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0 \quad \frac{-1}{+ \quad - \quad - \quad +}$$

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

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

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$$f(x) = \sqrt{3 + ax - x^2} \quad x=2 \rightarrow 3 - 2a - 1 = -1 - 2a = 0 \rightarrow a = -\frac{1}{2}$$

$$-x^2 - \frac{1}{2} + 3 \rightarrow \Delta = b^2 - 4ac \rightarrow \frac{1}{4} + 12 = \frac{49}{4} \rightarrow x \rightarrow \frac{\frac{1}{2} + \frac{7}{2}}{-2} = -2 \checkmark$$

$$a + b = -\frac{1}{2} + \frac{7}{2} = 3$$

$$\frac{\frac{1}{2} - \frac{7}{2}}{-2} = \frac{3}{2} = b \checkmark$$

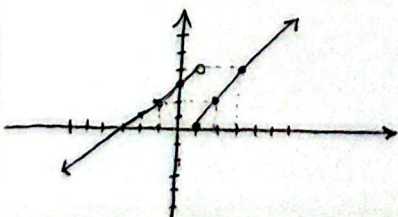
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$$f(x) = \begin{cases} 3x-2 & x \geq 1 \\ 2x+3 & x < 1 \end{cases} \quad g(x) = \sqrt{f(x) - (x)}$$

$$f(x) - (x) = \begin{cases} 2x-2 & x \geq 1 \\ x+3 & x < 1 \end{cases}$$

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

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$$f(x) = x^2 - 4x + 4 = (x-2)^2 \quad f\left(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}\right) \rightarrow f\left(\frac{\sqrt{2}}{2} + 1\right)$$

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

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$$f(x) = \frac{x+1}{x-1} \quad f(f(a)) = a \rightarrow \text{① متناظر متعكس}$$

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

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$$f(x) = x^2 - 4x \quad g(x) = \sqrt{x^2 - 1} \quad \left\{ \begin{array}{l} f(g(a)) = -1 \\ g(f(a)) = 0 \end{array} \right.$$

$$x^2 - 4x = -1$$

$$x^2 - 4x + 4 = 3$$

$$(x-2)^2 = 3 \rightarrow x-2 = \pm\sqrt{3} \rightarrow x = 2 \pm \sqrt{3} \rightarrow g(a) = 2 \pm \sqrt{3} \rightarrow \sqrt{x^2 - 1} = 2 \pm \sqrt{3} \rightarrow x^2 - 1 = (2 \pm \sqrt{3})^2 \rightarrow x^2 = 10 \pm 4\sqrt{3} \rightarrow x = \pm\sqrt{10 \pm 4\sqrt{3}}$$

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$$f(x+y) = x^2 - 2xy + y^2 = (x-y)^2 \quad \left\{ \begin{array}{l} f(1) \times f(-3) = ? \\ f(2) \times f(-4) = ? \end{array} \right.$$

$$f(1) \rightarrow x=1 \rightarrow (1-1)^2 = 0$$

$$1 \times 1 = 1$$

$$f(-3) \rightarrow x=-3 \rightarrow (-3-(-3))^2 = 0$$

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$$f(\cos x + \sin x) = \tan x \quad \left\{ \begin{array}{l} f(3/4) \\ f(4/5) \end{array} \right.$$

$$\cos x = \frac{3}{4} \rightarrow \left(\frac{3}{4} \times \frac{1}{3}\right) + \left(\frac{4}{5} \times \frac{1}{4}\right) = 1 + \frac{1}{5} = \frac{6}{5}$$

$$\tan x = \frac{4}{3} \rightarrow \sqrt{1 - \left(\frac{3}{4}\right)^2} = \frac{4}{5} \Rightarrow f(3/4) = 4/5$$

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