

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۲ کلاس B

$$f(x) = \begin{cases} (a+1)(x+2) & x > 1 \\ 3a+2x & x \leq 1 \end{cases} \quad \text{و } f(0) = f(-2) + a$$

$$f(0) = (a+1) \times 2 \rightarrow f(0) = 2a+2$$

$$2f(0) = f(-2) + a \quad \left. \begin{array}{l} f(0) = 2a+2 \\ f(-2) = 3a-2 \end{array} \right\} \rightarrow 2(2a+2) = 3a-2+a \rightarrow 4a+4 = 4a-2 \rightarrow 11 = a$$

$$\rightarrow 2f(0) = 2(2a+2) = 4a+4 = 4(11)+4 = 48$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2 \quad \text{و } f(2-\sqrt{3}) + f(2+\sqrt{3}) = ?$$

$$f(2-\sqrt{3}) = \sqrt{2-\sqrt{3}} + \frac{1}{\sqrt{2-\sqrt{3}}} + 2$$

$$f(2+\sqrt{3}) = \sqrt{2+\sqrt{3}} + \frac{1}{\sqrt{2+\sqrt{3}}} + 2$$

$$\rightarrow \sqrt{2+\sqrt{3}} \rightarrow \sqrt{2+\sqrt{3}} \cdot \sqrt{2-\sqrt{3}} = 2 - 3 = -1$$

$$\frac{1}{2+\sqrt{3}} = 2-\sqrt{3} \rightarrow f(2+\sqrt{3}) + f(2-\sqrt{3}) = 2 + 2 + 2 = 6$$

$$2f(x) - 3f(-x) = 5x^2 - x$$

$$2f(-x) - 3f(x) = 5(-x)^2 - (-x) = 5x^2 + x$$

$$\begin{cases} 2f(x) - 3f(-x) = 5x^2 - x \\ 2f(-x) - 3f(x) = 5x^2 + x \end{cases} \rightarrow -5f(x) = 10x^2 - 2x \rightarrow f(x) = -2x^2 + \frac{1}{5}x$$

$$2f(0) = 3x - 1$$

$$+ 9f(0) = 19 + 2x + 3x - 1 \rightarrow m = \frac{1+2f(0)}{3}$$

$$9f(0) = 10 + \frac{0+10f(0)}{3} \rightarrow 11f(0) = 10 \rightarrow f(0) = \frac{10}{11}$$

$$\rightarrow f(0) = \frac{10}{11}$$

$$f(-1) + f(1) = +3 + 2 + 3 \xrightarrow{-1} -11 \rightarrow f(-1) = -9$$

$$f(x) + f\left(\frac{1}{x}\right) = ax + b + \frac{a}{x} + b = \frac{ax^2 + bx + a}{x} \rightarrow a = 3, b = -9$$

$$f(-1) = 3(-1) + (-9) = -12$$

$$\begin{cases} f(x) = (x-1)\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \rightarrow Df = (-\infty, 1] \rightarrow \sqrt{1-x}(x-1)^2 \\ g(x) = \sqrt{(1-x)^3} \rightarrow (1-x)^3 \geq 0 \rightarrow 1-x \geq 0 \rightarrow (-\infty, 1] \quad Df = Dg \\ f(x) = -(1-x)\sqrt{1-x} = -\sqrt{(1-x)^2(1-x)} = -\sqrt{(1-x)^3} = g(x) \end{cases}$$

$$\Rightarrow f = g \circ$$

$$\begin{cases} f(x) = x\sqrt{x} \rightarrow x \geq 0 \rightarrow Df = [0, +\infty) \\ g(x) = \sqrt{x^3} \rightarrow x^3 \geq 0 \rightarrow x \geq 0 \rightarrow x \neq 0 \rightarrow Dg =]0, +\infty[\end{cases} \Rightarrow Df = Dg$$

$$x \geq 0 \Rightarrow f(x) = x\sqrt{x} = \sqrt{x^2 \cdot x} = \sqrt{x^3} = g(x)$$

$$\rightarrow f = g$$

$$\begin{cases} f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow \sqrt{x} \rightarrow x \geq 0 \rightarrow Df = [0, +\infty) \\ g(x) = \sqrt{x - |x|} \rightarrow x - |x| \geq 0 \rightarrow Dg = [0, +\infty) \end{cases}$$

$$f(x) = [\sqrt{x}] - \lfloor \sqrt{x} \rfloor = 0$$

$$g(x) = 0 \rightarrow x \geq 0 \rightarrow x - |x| = x - x = 0 \rightarrow f = g$$

$$\text{ا) } \frac{f(1) + g(1)}{f(1) - g(1)} = \frac{2+1}{2-1} = \frac{3}{1} = 3$$

$$\text{ب) } \frac{f(2) + g(2)}{f(2) - g(2)} = \frac{2+2}{2-2} = \frac{4}{0} \rightarrow \text{غير معرف}$$

$$\text{ج) } f(0) * g(-1) = 0 * 1 = 0$$

$$\begin{aligned} \text{ا) } 3x-1 &= 3 \rightarrow 3x=4 \rightarrow x=\frac{4}{3} \rightarrow (\frac{4}{3}, -1) \text{ و } 3x-1=-2 \rightarrow 3x=-1 \rightarrow x=-\frac{1}{3} \rightarrow (-\frac{1}{3}, 2) \\ 3x-1 &= 0 \rightarrow 3x=1 \rightarrow x=\frac{1}{3} \rightarrow (\frac{1}{3}, 5) \text{ و } 3x-1=-1 \rightarrow x=0 \rightarrow (0, 4) \text{ و } (-\frac{1}{3}, 2) \\ 3x-1 &= 2 \rightarrow 3x=3 \rightarrow x=1 \text{ و } g = f(\frac{4}{3}, -1) \text{ و } (-\frac{1}{3}, 2) \text{ و } (\frac{1}{3}, 5) \text{ و } (0, 4) \text{ و } (1, 1) \end{aligned}$$

$$\text{ب) } |x| = 3 \rightarrow x = \pm 3 \rightarrow (3, -1) \text{ و } (-3, 1)$$

$$3|x| = -2 \rightarrow \text{غير ممكن} \text{ و } |x| = 0 \rightarrow x = 0 \text{ و } |x| = -1 \rightarrow \text{غير ممكن}$$

$$|x| = 2 \rightarrow x = -2 \text{ و } 2 \rightarrow (\frac{4}{3}, -1) \text{ و } (-3, 1) \text{ و } (0, 0) \text{ و } (2, 1) \text{ و } (-2, 1)$$