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Subject:

Year: Month: Day:

حسابان یازدهم (تکلیف) ۱۸

۱)

$$\frac{2x}{2\sqrt{x^3}} = \frac{3xb}{3\sqrt[3]{x}}$$

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

باید برابر باشند $f'_-(a) = f'_+(a)$ و $f_-(a^-) = f(a^+)$

۲

$$f(x) = \frac{|2x - 3[x]|}{\sqrt[3]{x^2}} \qquad g(x) = \frac{|4x-2| + \sqrt{3x}}{\sqrt[3]{x^2}}$$

$$f'(1) - 2g'(4) = \frac{-2\sqrt{3x}}{\sqrt[3]{x^2}} =$$

$$\frac{-2\times c}{2\sqrt{3x}}(\sqrt[3]{x^2}) + \frac{2\cdot}{c\sqrt{x}}(-2\sqrt{3x}) =$$

$$-\sqrt{3} + 4\sqrt{3} = -5\sqrt{3}$$

۱٫۵

۳

$$\frac{1}{a} = b\frac{1}{a} + c \quad \Rightarrow \quad c = 0$$

$$-2 \qquad a \text{ برابر } 0$$

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

۱

۴ برای داشتن گوشه

$f(a^+) = f(a^-)$

اما $f'_+(a) \neq f'_-(a)$

مقدار حد باید خطی شود است

m برای اینکه پیوسته شود باید

$m = 1 \Rightarrow f(a^-) \neq f(a)$ دارد $m \neq 1$ ناپیوسته

۵

$$(f \circ g(x))' \quad g = \sqrt{2} \quad \Rightarrow 2 + \frac{1}{2x^3}$$

$$f(x) = \frac{1}{\sqrt[3]{\frac{x}{2x^3}}} \qquad = x \Rightarrow (f \circ g(x))' = 1$$

۲

Sayeh Roshan

$f(2) = -3a - 5$ —۴

$f'(2) = -a$

$f'(2) - f(2) = -a + 3a + 5 = 2$ $a = -1/5$

$f(2) = +4/5 - 5 = -0/5$ $\frac{f(2)}{f'(2)} = -\frac{1}{3}$ ۲

$f'(2) = -a = +1/5$

$g'(x) \Rightarrow \frac{2x}{3\sqrt[3]{(x^2-1)^2}} = \frac{\frac{4}{\sqrt{8}\times\sqrt{2}}}{4\times\frac{1}{2}} = \sqrt{2}$ —✓ ۱/۲۵

$g(x) = 2 \Rightarrow f(x) = (2x)^2 + 1 \Rightarrow 8x$

$g(x) f'og(x) = 16\sqrt{2}$ $\frac{-128\sqrt{2}}{16\sqrt{2}} = -8$

$g(x) = f(-1) + f(x^3)$ $g'(x) = f'(-1) + f'(4)$ —۸

$\frac{3}{2} + \frac{3}{2} = 3$ ۱/۷۵

Hop $\Rightarrow$ $\frac{-2f(5-h)f'(5-h) + 3f'(5-h)}{5 - 2h}$ —۹

$f(5) = \sqrt[3]{8} = 2$ $f'(x) = 1(\sqrt[3]{x+3}) + \frac{1}{3\sqrt[3]{(x+3)^2}}(x-4)$

$f'(5) = 2 + \frac{1}{12}$

$f'(5) = \frac{25}{12}$

$\frac{-2\times 2\times\frac{25}{12} + 3\frac{25}{12}}{5} = \frac{-\frac{25}{3}}{5}$ ۲

$\frac{-25}{60} = -\frac{5}{12}$

$4y = 3x + 1$ $m = \frac{1}{2} \Rightarrow$ شیب قائم $= -2$ ۱۰

$2x - 4 = -2 \Rightarrow x = 1$ نقطه $(1, 2)$ ۲

$1 - 4 + 5$

۲

$$f(x) = \frac{4-2x}{\sqrt[3]{x^2}} \to f'(1) = \frac{-2(\sqrt[3]{1}) - \frac{2}{3}(1)^{-\frac{1}{3}}(4-2)}{\sqrt[3]{1}} = -\frac{10}{3}$$

$$g(x) = \frac{|x-2| + \sqrt{3x}}{\sqrt[3]{x^2}} \to g'(1) = \frac{\left(-1 + \frac{3}{2\sqrt{3}}\right)(1) - \frac{2}{3\sqrt[3]{1}}(1+\sqrt{3})}{3\sqrt{1^4}}$$

$$g'(1) = -1 + \frac{3\sqrt{3}}{6} - \frac{2}{3} - \frac{2\sqrt{3}}{3} = -\frac{5}{3} - \frac{\sqrt{3}}{6}$$

$$f'(1) - 3g'(1) = -\frac{15}{3} + \frac{10}{3} + \frac{2\sqrt{3}}{6} = \frac{\sqrt{3}}{3}$$

۳

پیوستگی $\to ab + c = \frac{1}{a}$

مشتق‌پذیری $\to -\frac{1}{a^2} = b$

$$\left.\right\} -\frac{1}{a^2}(a) + c = \frac{1}{a} \to \frac{2}{a} = c \to ac = 2$$

۷

$$(f \circ g)' = g'\left(\frac{3}{\sqrt{8}}\right) \times f'\left(g\left(\frac{3}{\sqrt{8}}\right)\right)$$

$$g\left(\frac{3}{\sqrt{8}}\right) = \frac{1}{\sqrt[3]{\frac{9}{8}-1}} = 2 \to g'\left(\frac{3}{\sqrt{8}}\right) \times f'(2)$$

$$g'\left(\frac{3}{\sqrt{8}}\right) = -\frac{1}{3}(x^2-1)^{-\frac{4}{3}} \times 2x = \frac{6}{\sqrt{8}} \times -\frac{1}{3} \times \left(\frac{9}{8}-1\right)^{-\frac{4}{3}} = -\frac{2}{\sqrt{8}} \times (2^{-3})^{-\frac{4}{3}}$$

$$= -\frac{2^5 \times \sqrt{2}}{4} = -8\sqrt{8}$$

$$f(x),\ x = 2 \to f(x) = x[4]^2 + 1 = 16x^2 + 1 \to f'(2) = 32(2) = 64$$

$$\frac{-8\sqrt{2} \times \cancel{64}}{-\cancel{128}_{\,2}\sqrt{2}} = 4$$

۸

$$g'(x) = f'(x+1) + 3f'(3x+10)$$

$$\xrightarrow{x=-2} g'(-2) = f'(-1) + 3f'(4) \xrightarrow{f'(4) = f'(-1)} g'(-2) = 4f'(-1) = 4 \times \frac{3}{2} = \boxed{6}$$