مهرنیا _ ریاضی — دوازدهم رخند B

1)

$$f(x)=\begin{cases} a+\sqrt{x^2} & x<1 \\ b\sqrt[3]{x^2} & x\geq 1 \end{cases}$$

$\xrightarrow{x=1}$ $a+1=b$ $\quad a+b=2$

$$f'(x)=\begin{cases} 1 & x<1 \\ \dfrac{b\,2x}{3\sqrt[3]{x}} & x\geq 1 \end{cases}$$

$\frac{2b}{3}=1 \quad b=\frac{3}{2} \quad a=\frac{1}{2}$

---

2)

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

$f'(1)=\dfrac{-2(1)-\frac{2}{3}(2)}{1}=\dfrac{-10}{3} \qquad g'(1)=\dfrac{-5}{3}-\dfrac{\sqrt{3}}{9}$

---

3)

$$f(x)=\begin{cases} bx+c & x<a \\ \dfrac{1}{x} & x\geq a \end{cases}$$

$ab+c=\frac{1}{a}$, $b=\frac{-1}{a^2}$ $\Big\}$ $c=\frac{2}{a}$, $ac=2$

---

4)

$$f(x)=\begin{cases} b & x<a \\ b+(x-a)^m & x\geq a \end{cases} \qquad f'(x)=\begin{cases} 0 & x<a \\ m(x-a)^{m-1} & x\geq a \end{cases}$$

در مخرج باشد. $\quad m-1<0 \quad m<1$

---

5)

$g'\cdot f'(g(x))=(fog)'(x) \qquad g(x)=\dfrac{1}{2x^3},\ x<0 \qquad f(x)=\dfrac{1}{3\sqrt[3]{2x}},\ x<0$

$fog(x)=x \quad (fog)'(x)=1$

---

6)

$y=-ax+5 \quad y'=-a \quad \Big|^{3}\ 3a-5 \quad f(3)=-3a-5$

$-a+3a+5=2 \quad a=\frac{-3}{2} \quad f'(3)=-a \quad f'(3)=\frac{3}{2} \quad \dfrac{f(3)}{f'(3)}=\dfrac{-1}{3}$

---

7)

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

$(-8\sqrt{2})(f'(2))=(-8\sqrt{2})(64)$

$\dfrac{(-8\sqrt{2})(64)}{-128\sqrt{2}}=(4)$

---

8)

$g(x)=f(x+1)+f(2x+10) \qquad g'(-2)=f'(-1)+2f'(6)=(9)$

(۹) $\lim \frac{(f(5-h)-2)(f(5-h)-1)}{h(5-h)} = \frac{-f'(5)}{5} = \frac{-25}{12}\times\frac{1}{5} = \frac{-5}{12}$

$f(5)=2$

---

(۱۰) $y=x^2-4x+5 \qquad 4y-2x=1 \to y=\frac{x}{2}+\frac{1}{4}$

$y'=2x-4 \qquad m=\frac{1}{2} \to m'=-2$

$2x-4=-2 \qquad 2x=2 \qquad x=1$

$(1,2)$

Subject:

Year: Month: Day: Page:( )