

۱۹، ۲۵
آزمین

نام و نام خانوادگی محل پاسخنامه تشریحی تکلیف شماره ۲۲ ... کلاس B

($\lambda=0$) مشتق پذیر نیست $\Leftrightarrow$ تابع در $n=1$ باید مشتق پذیر باشد.

$\lambda=1$ تابع باید در $n=1$ مشتق پذیر باشد $\Rightarrow \frac{f(n)}{n^2} = b \frac{f(n)}{n^2} \Rightarrow b=1,5$
 $\Rightarrow a+1=b$ $\Rightarrow a=0,5$

$a+b=2$

$\lambda=1 \Rightarrow f'(n) = \frac{-2(\sqrt[3]{n^2}) - (f-2n)(\frac{2}{\sqrt[3]{n^2}})}{(\sqrt[3]{n^2})^2} \Rightarrow f'(1) = -\frac{10}{3}$

$\lambda=1 \Rightarrow g'(1) = \frac{(-1+\frac{2}{\sqrt[3]{n^2}})(\sqrt[3]{n^2}) - \frac{2}{\sqrt[3]{n^2}}(2-\lambda+\sqrt[3]{n^2})}{(\sqrt[3]{n^2})^2} = (\frac{\sqrt[3]{n^2}}{2}-1) - \frac{2}{\sqrt[3]{n^2}}(1+\sqrt[3]{n^2})$

$= \frac{\sqrt[3]{n^2}}{2} - 1 - \frac{2}{\sqrt[3]{n^2}} - \frac{\sqrt[3]{n^2}}{3} = \frac{\sqrt[3]{n^2}}{6} - 1 - \frac{2}{\sqrt[3]{n^2}} - \frac{\sqrt[3]{n^2}}{3}$
 $f'(1) - 2g'(1) = -\frac{10}{3} + \frac{10}{3} - \frac{\sqrt[3]{3}}{3} = \frac{\sqrt[3]{3}}{3}$

باید تابع در $n=a$ مشتق پذیر و راست برابر و مقدار تابع برابر باشد.

① $b = -\frac{1}{a^2} \Rightarrow a^2 b = -1$

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

~~$f(n) = \begin{cases} 0 & n < a \\ m(n-a)^{m-1} & n \geq a \end{cases}$~~

$f'(n) = \begin{cases} 0 & n < a \\ m(n-a)^{m-1} & n \geq a \end{cases} \begin{cases} m=0 \rightarrow f'_-(a) = f'_+(a) \times \\ m=1 \rightarrow f'_-(a) \neq f'_+(a) \checkmark \\ m \geq 2 \rightarrow f'_-(a) = f'_+(a) \times \end{cases}$

$m=1$

$g'(-\sqrt[3]{2}) f'(g(-\sqrt[3]{2})) = f \circ g(-\sqrt[3]{2})'$

$f \circ g = \frac{1}{\sqrt[3]{2g(n)}} = \frac{\frac{2}{3}n}{\sqrt[3]{\frac{2}{3}}} = n \rightarrow f \circ g' = 1$

8

① $f(-1) = f(e) = \frac{e}{e}$

② $g'(x) = f(x) + 2f(3x+10)$

③ $g(-2) = f(-1) + 2f(e) = \boxed{4}$

2

✓ جواب سوال 8

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

② $f(g)' = g'(x) \times f'(g(x)) = -\frac{1}{x} (x^2-1)^{-\frac{1}{2}} \times 2x \times \frac{1}{\sqrt{e^x-1}} \times e^x$

③ $= -\frac{1}{x} \times 2x \times \frac{1}{\sqrt{e^x-1}} \times e^x = -2e^{\frac{1}{2}} \sqrt{e^x-1}$
 $\frac{-2e^{\frac{1}{2}} \sqrt{e^x-1}}{-12\sqrt{e^x-1}} = \boxed{\frac{1}{6}}$

1, 8

① $f'(x) = -a$

② $f'(x) - f(x) = 2a - 5 = 2$

③ $f(x) = -2a - a$

④ $a = -\frac{3}{2}$
 $f(x) = -\frac{1}{2}$

1, 10

✓ جواب سوال 6

⑤ $\frac{f(x)}{f'(x)} = \frac{1}{x}$

$\lim_{h \rightarrow 0} \frac{(f(a-h)-1)(f(a-h)-2)}{h(a-h)} = \frac{f(a-h)-f(a)}{h} \times \frac{f(a)-1}{a}$

$= -f'(a) \times \frac{1}{a} = \boxed{-\frac{a}{12}}$

7

$y = \frac{1}{x} + \frac{1}{e} \rightarrow a_1 = \frac{1}{e} \rightarrow a_2 = -2$
 شیب خط مماس
 قریب صفر باشد

$y' = -\frac{1}{x^2} \rightarrow 2x - f = -2$

$x=1, y=2$

2

$$f(r) = -ra - a \quad f'(r) = -a$$

$$-a - (-ra - a) = r \rightarrow ra = -r \rightarrow a = -\frac{r}{r}$$

$$-r(-\frac{r}{r}) - a = -\frac{1}{r}$$

$$\rightarrow \frac{f(r)}{f'(r)} = \frac{-\frac{1}{r}}{-\frac{r}{r}} = \frac{1}{r}$$

4

$$(f \circ g)' = g'(\frac{r}{\sqrt{\lambda}}) \times f'(g(\frac{r}{\sqrt{\lambda}}))$$

$$g(\frac{r}{\sqrt{\lambda}}) = \frac{1}{\sqrt{\frac{9}{\lambda} - 1}} = r \rightarrow g'(\frac{r}{\sqrt{\lambda}}) \times f'(r)$$

$$g'(\frac{r}{\sqrt{\lambda}}) = -\frac{1}{r} (u^r - 1)^{-\frac{r}{r}} \times r u = \frac{9}{\sqrt{\lambda}} \times -\frac{1}{r} \times (\frac{9}{\lambda} - 1)^{-\frac{r}{r}} = -\frac{r}{\sqrt{\lambda}} \times (r^r)^{-\frac{r}{r}}$$

$$= -\frac{r^2 \times \sqrt{r}}{r} = -\lambda \sqrt{\lambda}$$

$$f(u), u = r \rightarrow f(u) = u[\varepsilon]_{+1}^r = uu_{+1}^r \rightarrow f'(r) = rr(r) = 4r$$

$$\frac{-\lambda \sqrt{r} \times 4r}{-\cancel{1} \lambda \sqrt{r}} = r$$

✓