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۱- $\frac{ax^2}{\sqrt{x^3}} = \frac{ax^2}{x^{\frac{3}{2}}} \xrightarrow{x=1} 1 = \frac{a}{3} \Rightarrow b = \frac{3}{2}$, $a+1=b$, $a = \frac{1}{2}$

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

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

$= -2\sqrt{x^2}\,(x)^{\frac{1}{2}-\frac{2}{3}}$

$\longrightarrow -2\sqrt{x^2}\times x^{-\frac{1}{6}} = -\frac{1}{4} = \frac{\sqrt{2}}{3}$

۳- $ab+c = \frac{1}{a} \Rightarrow \frac{-1}{a^2}\times a + c = \frac{1}{a} \Rightarrow \frac{-1}{a} + c = \frac{1}{a} \Rightarrow c = \frac{2}{a}$, $a\times c = \frac{2}{a}\times a = 2$

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

۴- $(x-a)^m + b = b \Rightarrow (x-a)^m = 0$, $m(x-a)^{m-1}(1) \neq 0 \Rightarrow m=1$

$m=1 \Rightarrow (x-a)^0 \Rightarrow 1 \neq 0$

۵- $(f\circ g)'(x) = \frac{1}{\sqrt[3]{\frac{1}{x^3-x^2}-\left|\frac{1}{x^3-x^2}\right|}}$, $x = -\sqrt[3]{2}$, $\frac{1}{\sqrt[3]{\frac{1}{x^3}}} = \frac{1}{\frac{1}{x}}$

$x = 2$

$\Rightarrow (f\circ g)'(x) = 1$

۶- $a = \frac{-3}{2}$, $-b-(-3a-6) = 2a+6 \Rightarrow a+6 = 2$, $f(x) = -3x^2-6$, $f'(x) = -6x$

$\frac{f'(x)}{f(x)} = \frac{-1}{2} = -\frac{1}{2}$, $f(x) = \frac{2}{3}$, $f'(x) = \frac{3}{2}$

۷- $(f\circ g)'(x) = g'(x)\,f'(g(x))$

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

$= -3\times 4\times 2 = -24$

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

$= 4$

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۸. $g(-2) = f(-1) + f(4) \Rightarrow g'(-2) = f'(-1) + f'(4)$

$f'(-1) = f'(4) = \frac{3}{2} \Rightarrow g'(-2) = 2 \times \frac{3}{2} = 3$

۹. $\frac{-2f(5-h)f'(5-h) + 3f(5-h)}{+h+5-h} = \frac{-2f(5)f'(5) + 3f(5)}{5}$

$f(5) = 1 \times 2 = 2 \qquad f'(5) = (5-4)\left(\frac{1}{\sqrt[3]{(5+3)^2}}\right) + \sqrt[3]{5+3} = 1 \times \frac{1}{3 \times 4} + 2 = \frac{1}{12} + 2 = \frac{25}{12}$

$\frac{-2 \times 2 \times 5 + 3 \times 2}{5} = \frac{\frac{-20}{3} + 6}{5} = \frac{\frac{-20+18}{3}}{5} = \frac{\frac{-2}{3}}{5} = \frac{-2}{15}$

۱۰. $4y - 3m = 1 \Rightarrow m = \frac{1}{2} \qquad m' = -2 \qquad y' = 3m - 4 = -2 \Rightarrow m = 1$

$y = 1 - 4 + 5 = 2 \qquad \left|\frac{1}{2}\right.$

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