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Registration No: 05IPPI8F1002

Program / Section: IPP1

Coursework Assessment: ~~End of chapt~~ Group Discussion 1

Course Name: PBM 1035 Intensive ~~Matematik~~ Mathematics

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Question 1 (Find the derivatives of the following functions. Simplify your answers.)

(a) $y = \frac{5}{6} x^3$

(Ming Foo)

$$\frac{dy}{dx} = \frac{5}{6} (3) x^{3-1}$$

$$= \frac{15}{6} x^2$$

$$= \frac{5}{2} x^2$$

b) $y = \frac{5}{6} x^3$

$$= \frac{5}{6} (3) x^{3-1}$$

$$= \frac{5}{2} x^2$$

c) $y = \frac{5}{6} x^3$

$$\frac{dy}{dx} = \frac{5}{6} (3) x^{3-1}$$

$$= \frac{15}{6} x^2$$

$$= \frac{5}{2} x^2$$

Comment: ~~Sealan~~ Question all can do it.

(b) $y = 2x^{-3}$

$$\frac{dy}{dx} = 2(-3) x^{-3-1}$$

$$= -6 x^{-4}$$

$$= -\frac{6}{x^4}$$

$$= -\frac{6}{x^4}$$

b) $y = 2x^{-3}$

$$= 2(-3) x^{-3-1}$$

$$= -6 x^{-4}$$

$$= -\frac{6}{x^4}$$

c) $y = 2x^{-3}$

$$\frac{dy}{dx} = 2(-3) x^{-3-1}$$

$$= -6 x^{-4}$$

$$= -\frac{6}{x^4}$$

Comment: Question all can do it.

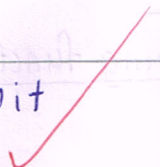
Good job

Question 2 (Differentiate the following with respect to x).

$$\begin{aligned} (a) y &= 2\sqrt{x} + 6x + 2 \\ y &= 2x^{\frac{1}{2}} + 6x + 2 \\ y &= 2x^{\frac{1}{2}} + 6x + 0 \\ \frac{dy}{dx} &= 2\left(\frac{1}{2}\right)x^{\frac{1}{2}-1} + 6(1)x^{1-1} \\ &= \frac{2}{2}x^{-\frac{1}{2}} + 6 \\ &= x^{-\frac{1}{2}} + 6 \\ &= \frac{1}{x^{\frac{1}{2}}} + 6 \quad \checkmark \end{aligned}$$

$$\begin{aligned} a) y &= 2\sqrt{x} + 6x + 2 \\ &= 2x^{\frac{1}{2}} + 6x + 2 \\ &= 2\left(\frac{1}{2}\right)x^{\frac{1}{2}-1} + 6 + 0 \\ &= x^{-\frac{1}{2}} + 6 \\ &= \frac{1}{x^{\frac{1}{2}}} + 6 \quad \checkmark \end{aligned}$$

$$\begin{aligned} a) y &= 2\sqrt{x} + 6x + 2 \\ &= 2x^{\frac{1}{2}} + 6x + 2 \\ &= \frac{2}{2}x^{\frac{1}{2}-1} + 6(1)x^{1-1} + 0 \\ \frac{dy}{dx} &= 2\left(\frac{1}{2}\right)x^{\frac{1}{2}-1} + 6(1)x^{1-1} + 0 \\ &= \frac{2}{2}x^{-\frac{1}{2}} + 6 \\ &= x^{-\frac{1}{2}} + 6 \\ &= \frac{1}{x^{\frac{1}{2}}} + 6 \quad \checkmark \end{aligned}$$

Comment: Types question all can do it 

$$\begin{aligned} (b) y &= \frac{5x^2 + 4x + 2}{2x^3} \\ &= \frac{5x^2}{2x^3} + \frac{4x}{2x^3} + \frac{2}{2x^3} \\ \frac{dy}{dx} &= \frac{2 \cdot 5x^{2-3}}{2x^3} + \frac{2 \cdot 1x^{1-3}}{2x^3} + x^{-3} \\ &= \frac{2 \cdot 5(-1)x^{-1-1}}{2x^3} + \frac{2(-2)x^{-2-1}}{2x^3} + 1(-3)x^{-3-1} \\ &= -2.5x^{-2} - 4x^{-3} - 3x^{-4} \\ &= -2.5\left(\frac{1}{x^2}\right) - 4\left(\frac{1}{x^3}\right) - 3\left(\frac{1}{x^4}\right) \\ &= -\frac{2.5}{x^2} - \frac{4}{x^3} - \frac{3}{x^4} \quad \checkmark \end{aligned}$$

$$\begin{aligned} b) y &= \frac{5x^2 + 4x + 2}{2x^3} \\ y &= \frac{5x^2}{2x^3} + \frac{4x}{2x^3} + \frac{2}{2x^3} \\ y &= 2.5x^{2-3} + 2x^{1-3} + x^{-3} \\ y &= 2.5x^{-1} + 2x^{-2} + x^{-3} \\ &= 2.5(-1)x^{-1-1} + 2(-2)x^{-2-1} + 1(-3)x^{-3-1} \\ &= -2.5x^{-2} - 4x^{-3} - 3x^{-4} \\ &= -2.5\frac{1}{x^2} - 4\frac{1}{x^3} - 3\frac{1}{x^4} \\ &= -\frac{2.5}{x^2} - \frac{4}{x^3} - \frac{3}{x^4} \end{aligned}$$

$$\begin{aligned} b) y &= \frac{5x^2 + 4x + 2}{2x^3} \\ &= \frac{5x^2}{2x^3} + \frac{4x}{2x^3} + \frac{2}{2x^3} \\ &= 2.5x^{2-3} + 2x^{1-3} + x^{-3} \\ &= 2.5x^{-1} + 2x^{-2} + x^{-3} \\ \frac{dy}{dx} &= 2.5(-1)x^{-1-1} + 2(-2)x^{-2-1} + 1(-3)x^{-3-1} \\ &= -2.5x^{-2} - 4x^{-3} - 3x^{-4} \\ &= -\frac{2.5}{x^2} - \frac{4}{x^3} - \frac{3}{x^4} \end{aligned}$$

Comment: Question can do it.

Question 3 (Determine the differentiation for the following function)

(Ming Foo)

$$\begin{aligned}
 y &= \frac{6x^3 + 4x^2 - 3x - 1}{x^2} \\
 &= 6x^{3-2} + 4x^{2-2} - 3x^{-2} - 1x^{-2} \quad \text{coreless} \\
 &= 6x + 4 - 3x^{-2} - x^{-2} \\
 \frac{dy}{dx} &= 6(1)x^{1-1} + 4(1)x^{1-1} - 3(-2)x^{-2-1} - 1(-2)x^{-2-1} \\
 &= 6 + 4 + 6x^{-3} - x^{-3} \\
 &= 6 + 4 + \frac{6}{x^3} - \frac{1}{x^3}
 \end{aligned}$$

Correction

$$\begin{aligned}
 &= \frac{6x^3}{x^2} + \frac{4x^2}{x^2} - \frac{3x}{x^2} - \frac{1}{x^2} \\
 &= 6x^{3-2} + 4x^{2-2} - 3x^{1-2} - x^{0-2} \\
 &= 6x + 4 - 3x^{-1} - x^{-2} \\
 &= 6x + 0 - 3x^{-1} - x^{-2-2} \\
 \frac{dy}{dx} &= 6(1)x^{1-1} - 3(-1)x^{-1-1} - 1(-2)x^{-2-1} \\
 &= 6 + 3x^{-2} + 2x^{-3} \\
 &= 6 + 3\left(\frac{1}{x^2}\right) + 2\left(\frac{1}{x^3}\right) \\
 &= 6 + \frac{3}{x^2} + \frac{2}{x^3}
 \end{aligned}$$

$$\begin{aligned}
 y &= \frac{6x^3 + 4x^2 - 3x - 1}{x^2} \\
 &= \frac{6x^3}{x^2} + \frac{4x^2}{x^2} - \frac{3x}{x^2} - \frac{1}{x^2} \\
 &= 6x + 4 - 3x^{-1} - x^{-2}
 \end{aligned}$$

$$\begin{aligned}
 \frac{dy}{dx} &= 6(1)x^{1-1} + 4(1)x^{1-1} - 3(-1)x^{-1-1} - 1(-2)x^{-2-1} \\
 &= 6 + 4 - 3x^{-2} + 2x^{-3} \\
 &= 6 + 4 - \frac{3}{x^2} + \frac{2}{x^3}
 \end{aligned}$$

$$y = \frac{6x^3 + 4x^2 - 3x - 1}{x^2}$$

$$\begin{aligned}
 &= \frac{6x^3}{x^2} + \frac{4x^2}{x^2} - \frac{3x}{x^2} - \frac{1}{x^2} \\
 &= 6x + 4 - 3x^{-1} - x^{-2}
 \end{aligned}$$

$$\begin{aligned}
 \frac{dy}{dx} &= 6(1)x^{1-1} + 4(1)x^{1-1} - 3(-1)x^{-1-1} - 1(-2)x^{-2-1} \\
 &= 6 + 4 + 3x^{-2} + 2x^{-3}
 \end{aligned}$$

Answer: little bit cant confirm.