

Quiz 9

(3) 1. $\int \left(\frac{3}{\sqrt[3]{x}} - 5\sqrt[3]{x^2} \right) dx = \int \left(3x^{-1/3} - 5x^{2/3} \right) dx = 3 \frac{x^{2/3}}{2/3} - 5 \frac{x^{5/3}}{5/3} + C$ 1pt. 1pt.

(3) 2. $\int (40x^3 - 9x + 3 + \cos(x)) dx = 40 \frac{x^4}{4} - 9 \frac{x^2}{2} + 3x + \sin(x) + C$ 1pt. 1pt. 1pt.

(4) 3. Solve the initial value problem

$$\frac{dy}{dx} = \frac{8}{x^9} + 6x^2; \quad y(1) = 3.$$

$$y = \int (8x^{-9} + 6x^2) dx = 8 \frac{x^{-8}}{-8} + 6 \frac{x^3}{3} + C$$

$$y = -x^{-8} + 2x^3 + C \quad (2pts.)$$

$$y(1) = -1 + 2 + C = 1 + C$$

$$1 + C = 3 \Rightarrow C = 2 \quad (2pts.)$$

$$\boxed{y = -x^{-8} + 2x^3 + 2}$$