

Note: Attempt all questions. Use examples and diagrams where necessary.

Q.1

- a) Differentiate $\frac{3x^3 - 5x^2 + 5}{x^2 + 1}$ with respect to x .
- b) Differentiate $\frac{(x^2 + 1)^2}{x^2 - 1}$ with respect to x .

Q.2

- a) Find $\frac{dy}{dx}$ if $y = (1 + 2\sqrt{x})^3 \cdot x^{2/3}$ using chain rule.
- b) Find $\frac{dy}{dx}$ if $y = \sqrt{\frac{1-x}{1+x}}$ using chain rule.

Q.3

- a) Find the Integration of $\int \frac{1}{\sqrt{x^3}} dx$.
- b) Find the Integration of $\int \frac{1}{(6x+7)^6} dx$.