

EXERCISE 5.3

Find $\frac{dy}{dx}$ in the following (1 to 3) questions when :

- (i) $x = at^2, y = 2at$ (ii) $x = 2at^2, y = at^4$.
- (i) $x = 4t, y = \frac{4}{t}$ (ii) $x = t + \frac{1}{t}, y = t - \frac{1}{t}$.
- $x = \frac{1 + \log t}{t^2}, y = \frac{3 + 2 \log t}{t}$.
- If $x = \frac{2bt}{1+t^2}$ and $y = \frac{a(1-t^2)}{1+t^2}$, find $\frac{dy}{dx}$ at $t = 2$.
- (i) Differentiate $\frac{x^2}{1-x^2}$ w.r.t. x^2 (ii) Differentiate x^x w.r.t. $x \log x$.

Answers

1. (i) $\frac{1}{t}$

(ii) t^2

2. (i) $-\frac{1}{t^2}$

(ii) $\frac{t^2 + 1}{t^2 - 1}$

3. t

4. $\frac{4a}{3b}$

5. (i) $\frac{1}{(1-x^2)^2}$

(ii) x^x