

# ACHIEVERS FOUNDATION

## DIFFERENTIATION OF IMPLICIT FUNCTIONS

Find  $dy/dx$  in each of the following

1)  $y^3 - 3xy^2 = x^3 + 3x^2y$

2)  $x^{2/3} + y^{2/3} = a^{2/3}$

3)  $4x + 3y = \log(4x-3y)$

4)  $x^5 + y^5 = 5xy$

5)  $(x+y)^2 = 2axy$

6) If  $\sqrt{(1-x^2)} + \sqrt{(1-y^2)} = a(x-y)$ , prove that  $dy/dx = \{\sqrt{(1-y^2)}/\sqrt{(1-x^2)}\}$

7)  $xy^2 = 1$  prove that  $2(dy/dx) + y^3 = 0$

Differentiate the following functions with respect to  $x$  :-

8)  $\log \{x + \sqrt{(a^2 + x^2)}\}$

9)  $\log \{(a+b\sin x)/(a-b\sin x)\}$

10)  $(e^x + e^{-x})/(e^x - e^{-x})$