

**DIFFERENTIATION & APPLICATIONS (Q 6 & 7, PAPER 1)**

**LESSON NO. 2: TRIGONOMETRIC DIFFERENTIATION**

**2005**

6 (b) Let  $y = \frac{1 - \cos x}{1 + \cos x}$ .

Show that  $\frac{dy}{dx} = t + t^3$ , where  $t = \tan\left(\frac{x}{2}\right)$ .

**2003**

7 (a) Differentiate each of the following with respect to  $x$ :

(i)  $\cos^4 x$

7 (c) (ii) Given that  $f(\theta) = \sin(\theta + \pi)\cos(\theta - \pi)$ , find the derivative of  $f(\theta)$  and express it in the form  $\cos n\theta$  where  $n \in \mathbf{Z}$ .

**2002**

6 (b) (ii) Given  $y = 2x - \sin 2x$ , find  $\frac{dy}{dx}$ . Give your answer in the form  $k \sin^2 x$ , where  $k \in \mathbf{Z}$ .

**2001**

7 (b) (ii) Given that  $y = \sin x \cos x$ , find  $\frac{dy}{dx}$  and express it in the form  $\cos nx$  where  $n \in \mathbf{Z}$ .

**ANSWERS**

**2003** 7 (a) (i)  $\frac{dy}{dx} = -4\cos^3 x \sin x$  7 (c) (ii)  $f'(\theta) = \cos 2\theta$

**2002** 6 (b) (ii)  $\frac{dy}{dx} = 4 \sin^2 x$

**2001** 7 (b) (ii)  $\frac{dy}{dx} = \cos 2x$