1) $(x, \sin x) \quad (x+h, \sin(x+h))$

$\quad x_1 \quad\quad y_1 \quad\quad\quad x_2 \quad\quad\quad y_2$

$$\frac{d(\sin x)}{dx} = \frac{\sin(x+h) - \sin x}{x+h - x}$$

$$= \frac{\sin(x+h) - \sin x}{h}$$

$$= \frac{\sin x \cos h + \cos x \sin h - \sin x}{h}$$

$$= \frac{\sin x \cos h - \sin x}{h} + \frac{\cos x \sin h}{h}$$

$$= \left(\frac{\cos h - 1}{h}\right) \sin x + \left(\frac{\sin h}{h}\right) \cos x$$

As $h \rightarrow 0$

$$\frac{d(\sin x)}{dx} = (0) \sin x + (1) \cos x$$

$$= \underline{\underline{\cos x}}$$

2) $(x, \cos x) \quad (x+h, \cos(x+h))$
$\quad x_1 \quad y_1 \quad\quad x_2 \quad y_2$

$$\frac{d(\cos x)}{dx} = \frac{\cos(x+h) - \cos x}{x+h-x}$$

$$= \frac{\cos x \cosh - \sin x \sinh - \cos x}{h}$$

$$= \frac{\cos x \cosh - \cos x}{h} - \frac{\sin x \sinh}{h}$$

$$= \left(\frac{\cosh - 1}{h}\right)\cos x - \left(\frac{\sin h}{h}\right)\sin x$$

As $h \to 0$

$$\frac{d(\cos x)}{dx} = (0)\cos x - (1)\sin x$$

$$= \underline{\underline{-\sin x}}$$