

$$(v) \quad y = (x + \sin 2x)$$

on separate page
page $\rightarrow$ (vi)

(b)
(vii)

$$\frac{dy}{dx} = 1 + 2\cos 2x$$

$$y = \frac{1}{2}x + \cos 2x \quad \text{find } \frac{d^5 y}{dx^5}$$

$$\frac{dy}{dx} = -x^{-2} - 2\sin 2x$$

$$\frac{d^2 y}{dx^2} = 2x^{-3} - 4\cos 2x$$

$$\frac{d^3 y}{dx^3} = -6x^{-4} + 8\sin 2x$$

$$\frac{d^4 y}{dx^4} = 24x^{-5} + 16\cos 2x$$

$$\frac{d^5 y}{dx^5} = -120x^{-6} - 32\sin 2x$$

c)

$$f(x) = \ln(\operatorname{cosec} x - \cot x) \quad f'(x) = \operatorname{cosec} x$$

$$u = \operatorname{cosec} x - \cot x$$

$$f(x) = \frac{1}{u}$$

$$\frac{du}{dx} = -\cot x \operatorname{cosec} x + \operatorname{cosec}^2 x$$

$$= -\frac{\cos x}{\sin^2 x} + \frac{1}{\sin^2 x}$$

$$= \frac{1 - \cos x}{\sin^2 x}$$

$$= \sin x$$

$$f'(x) = \frac{1}{\sin x} = \underline{\underline{\operatorname{cosec} x}}$$