Start here for Question Number: 2

a) $\frac{\cos x}{x}$

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

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

b. $x^2 - x - 12 < 0$.

$(x-4)(x+3) < 0$.

$3 < x < 4$

c. $y = \ln x$ at $x = 2$

$y' = \frac{1}{x}$

$y' = \frac{1}{2}$.

d. i) $\int \sqrt{5x+1}\, dx$.

$\int (5x+1)^{\frac{1}{2}}\, dx$

$\frac{2}{3}(5x+1)^{\frac{3}{2}} + C$.

ii) $\int \frac{x}{4+x^2}\, dx$

$\int x(4+x^2)^{-1}\, dx$.

$\frac{x}{0}(4+x^2)^{0}\, dx$.

$x(4^{-1} + x^{-2})$

$\frac{x}{4} + \frac{x}{x^2}$

$\frac{x}{4} + \frac{1}{x}$

$x4^{-1} + x^{-1}$

$x + 1 + C$.

e) $\int_0^6 (x+k)\,dx = 30.$

$$\left[\frac{1}{2}x^2 + kx\right]_0^6 = 30.$$

$$\left[\frac{1}{2}\times 36 + k6\right] - [0] = 30$$

$$18 + 6k = 30$$

$$6k = 12$$

$$k = 2$$

Additional writing space on back page.

You may ask for an extra Writing Booklet if you need more space to answer question 2.