4. **Figure 1**

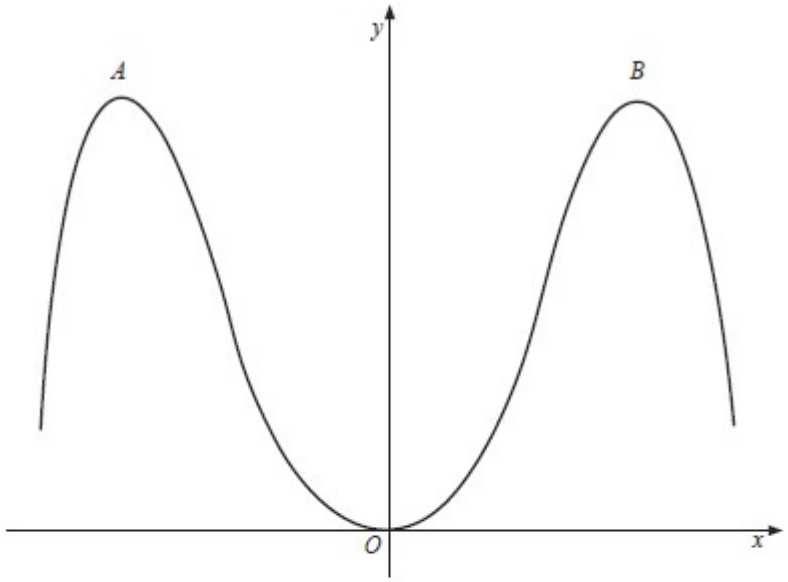

Figure 1 shows a sketch of the curve C with equation

$$y = \cos x \ln(\sec x), \qquad -\frac{\pi}{2} < x < \frac{\pi}{2}.$$

The points A and B are maximum points on C.

(a) Find the coordinates of B in terms of e.

(5)

The finite region R lies between C and the line AB.

(b) Show that the area of R is

$$\frac{2}{e}\arccos\left(\frac{1}{e}\right) + 2\ln\left(e + \sqrt{(e^2 - 1)}\right) - \frac{4}{e}\sqrt{(e^2 - 1)}.$$

[arccos x is an alternative notation for $\cos^{-1}x$]

(8)