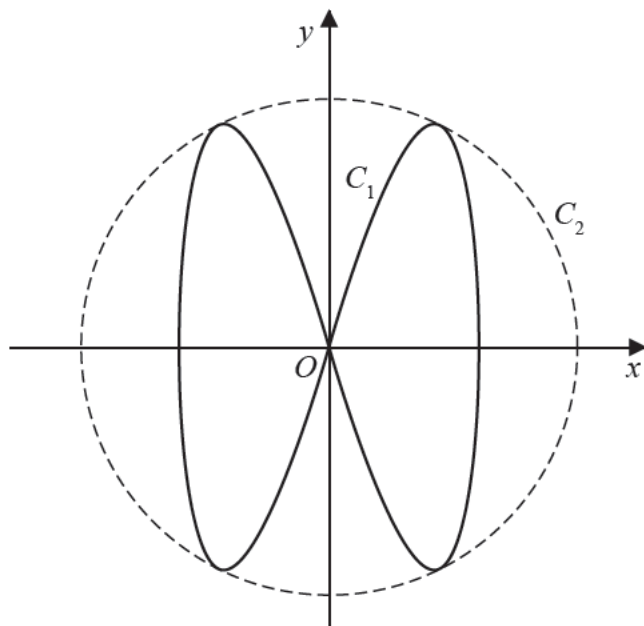


14.



**Figure 5**

Figure 5 shows a sketch of the curve  $C_1$  with parametric equations

$$x = 2\sin t, \quad y = 3\sin 2t \quad 0 \leq t < 2\pi$$

(a) Show that the Cartesian equation of  $C_1$  can be expressed in the form

$$y^2 = kx^2(4 - x^2)$$

where  $k$  is a constant to be found.

(4)

The circle  $C_2$  with centre  $O$  touches  $C_1$  at four points as shown in Figure 5.

(b) Find the radius of this circle.

(5)