6

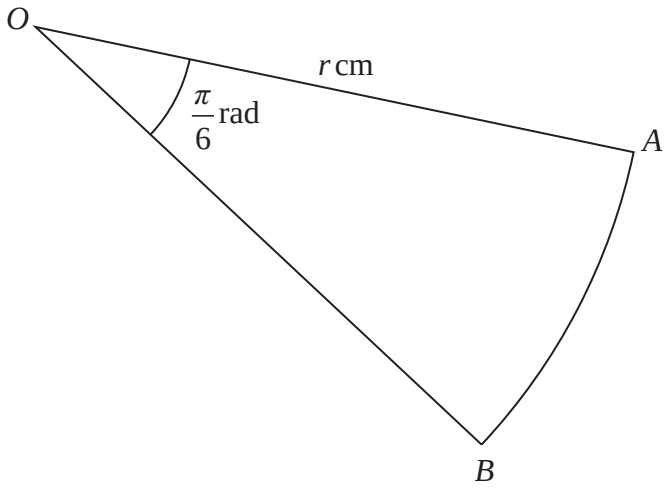

Diagram **NOT** accurately drawn

Figure 2

Figure 2 shows the sector OAB of a circle with centre O and radius r cm.

$$\angle AOB = \frac{\pi}{6} \text{ radians} \qquad OA = OB = r \text{ cm}$$

The area of the sector is increasing in such a way that the size of $\angle AOB$ remains constant, and the lengths OA and OB are both increasing at a constant rate of $0.2\,\text{cm/s}$

Find the exact rate of change, in cm^2/s, of the area of the sector when the length of arc AB is $\frac{5\pi}{2}$

(6)

Question 6 continued

(Total for Question 6 is 6 marks)