**6**

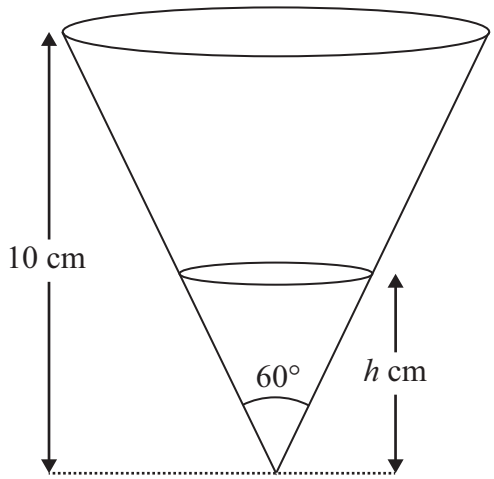


Diagram **NOT** accurately drawn

**Figure 3**

A container in the shape of a right circular cone of height 10 cm is fixed with its axis of symmetry vertical. The vertical angle of the container is 60°, as shown in Figure 3. Water is dripping out of the container at a constant rate of 2 $cm^3/s$. At time $t = 0$ the container is full of water. At time $t$ seconds the depth of water remaining is $h$ cm.

(a) Show that $h = \left[1000 - \frac{18t}{\pi}\right]^{\frac{1}{3}}$

**(6)**

(b) Find, in $cm^2/s$, to 3 significant figures, the rate of change of the area of the surface of the water when $t = 15$

**(6)**

**Question 6 continued**

**Question 6 continued**

**Question 6 continued**

**(Total for Question 6 is 12 marks)**