**6**

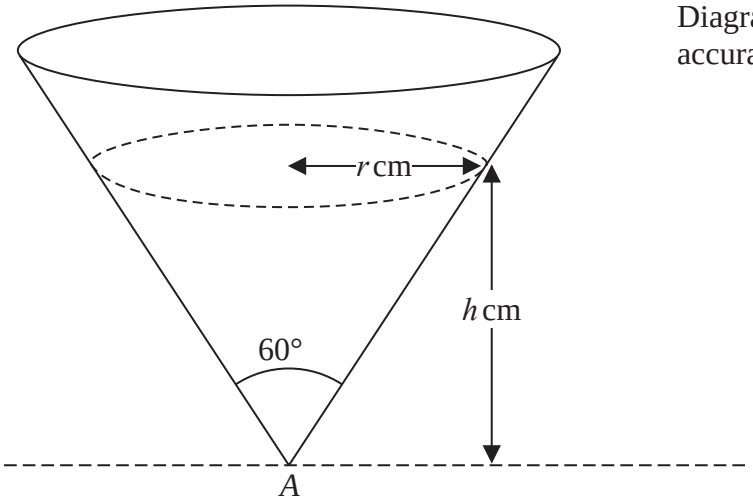


Diagram **NOT** accurately drawn

**Figure 4**

Figure 4 shows a hollow right circular cone fixed with its axis of symmetry vertical.

The cone is inverted and contains liquid, which is dripping out of a small hole at the vertex $A$ of the cone at a constant rate of $0.9\,\text{cm}^3/\text{s}$.

At time $t$ seconds after the liquid starts to drip from the cone, the height of the liquid is $h$ cm above $A$. The volume of liquid in the cone at time $t$ seconds is $V\,\text{cm}^3$

The vertical angle of the cone is 60°

(a) Show that $V = \frac{1}{9}\pi h^3$

**(2)**

(b) Find, in cm/s to 3 significant figures, the rate at which the height of the liquid is decreasing when the height of the liquid in the cone above the vertex is 1.2 cm.

**(4)**

**Question 6 continued**

**Question 6 continued**

**Question 6 continued**

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