1. Find the volume of a right circular cone with base radius $R$ and height $h$.

![Diagram of a right circular cone with labeled dimensions]

**Hints:** Follow these steps:

(i) Let $r$ be the radius of the cross section at a distance of $x$ from the vertex.

(ii) Use the similar triangles to write $r$ in terms of $x$, $R$, and $h$.

(ii) Find a function, $A(x)$, for the area of each cross section.

(iii) Integrate $A(x)$.

*This problem is worth 10 points.*