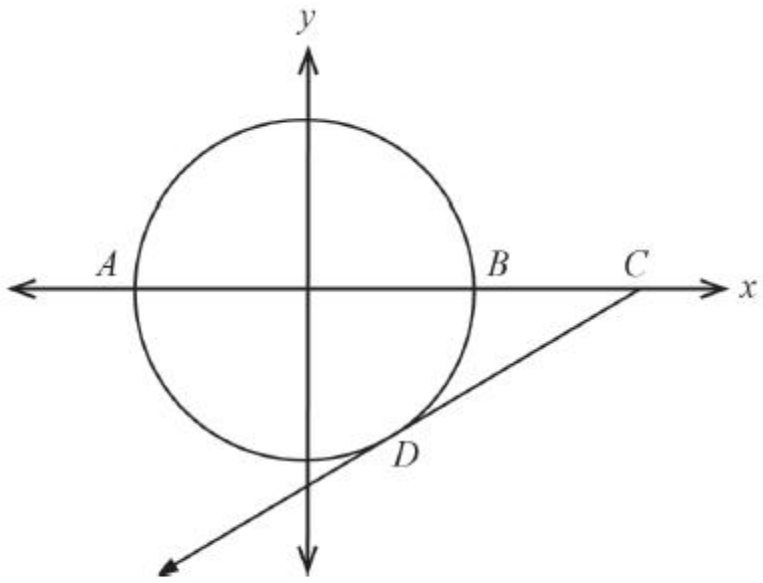
Question 17 **(8 marks)**

The diagram shows a circle with equation $x^2 + y^2 = 16$ with points A, B being the horizontal intercepts of this circle. DC is the tangent to the circle at point D, intersecting the x axis at point C. Point D has coordinates $(2, -2\sqrt{3})$.



(a) Show that the equation for the tangent at point D can be written in the form $\sqrt{3}y = x - 8$. (3 marks)

(b) Determine the coordinates of point C. (1 mark)

The region bounded by the arc AD, the line segment $\overline{DC}$ and the x axis is rotated about the x axis.

(c) Determine the volume of the resulting solid, correct to the nearest 0.01 cubic units. (4 marks)