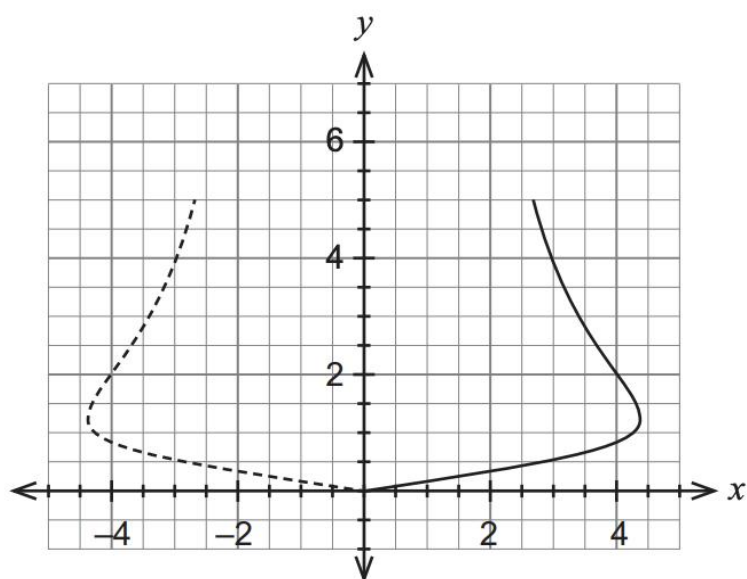


Question 8**(5 marks)**

The top part of a wine glass is modelled by rotating the graph of $x^2 = y^2(36 - x^2y)$ from $y = 0$ to $y = 5$ about the y axis as shown below. Dimensions are measured in centimetres.



- (a) Show that the volume, $V \text{ cm}^3$, when the glass is full is given by

$$V = \pi \int_0^5 \frac{36y^2}{1 + y^3} dy.$$

(1 mark)

(b) Determine the exact volume V cm³.

(4 marks)