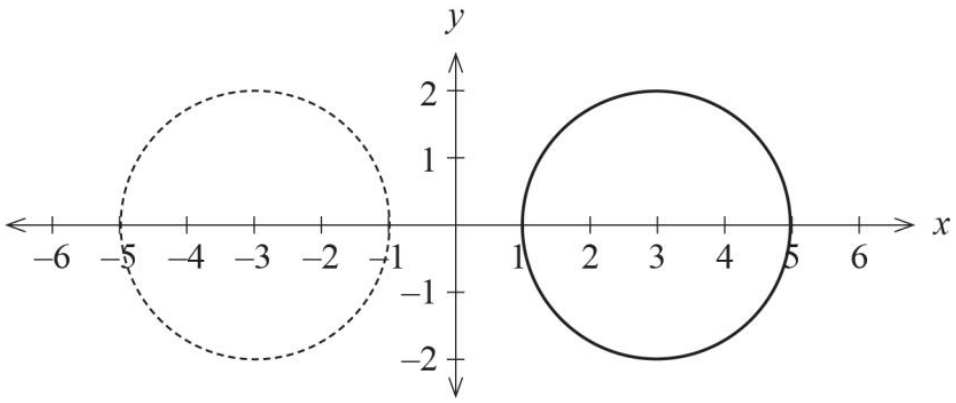
Question 11 **(6 marks)**

Scrummy Donuts are modelled by the circular region bounded by the circle $(x-3)^2+y^2=4$ being rotated about the y axis to produce a donut-shaped object called a torus. All dimensions are in centimetres.



(a) Show that the volume of this donut is given by $\int_a^b 12\pi\sqrt{4-y^2}\,dy$.

State the values for a and b. (4 marks)

Nutritional information about Scrummy Donuts*: Average density = 0.28 g/cm^3
Health recommendation: No more than 180 g to be eaten per day. (*eat responsibly)

(b) Calculate the maximum number of Scrummy Donuts that can be eaten each day, if the health recommendation is to be followed. (2 marks)