**4A/B Volumes of Revolution**

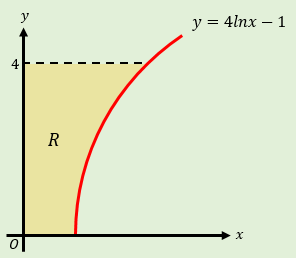
A Reminder from CP1:

1. The region R is bounded by the curve with equation , the x-axis and the lines

and .

Find the volume of the solid formed when region is rotated through radians about the x-axis.

1. The diagram shows the curve with equation .

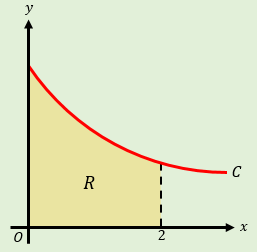


**4C Revolutions with Parametrics**

1. The curve shown has parametric equations:

The region is bounded by the curve, the x-axis and the lines and .

Find the exact volume of the solid formed when is rotated radians about the x-axis.

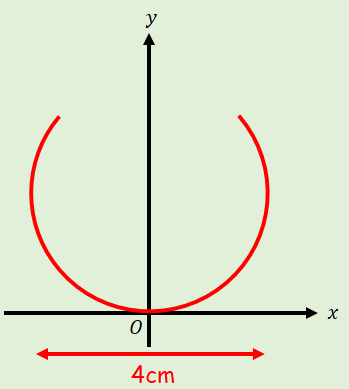


**4D Modelling with Volumes of Revolution**

1. The diagram shows a model of a goldfish bowl. The cross section of the bowl is described by the curve with parametric equations:

Where the units of and are in cm. The bowl is formed by rotating this curve about the y-axis to form a solid of revolution.

1. Find the volume of water required to fill the model to a height of 3cm.



1. The real bowl has a diameter of 48cm. Find the volume of water needed to fill it to the corresponding height