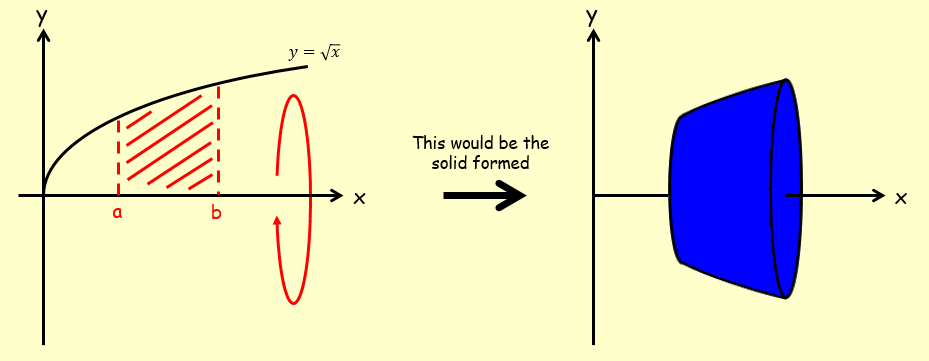
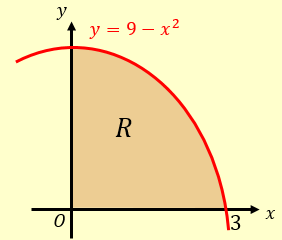
**5A Rotations Around the x-axis**



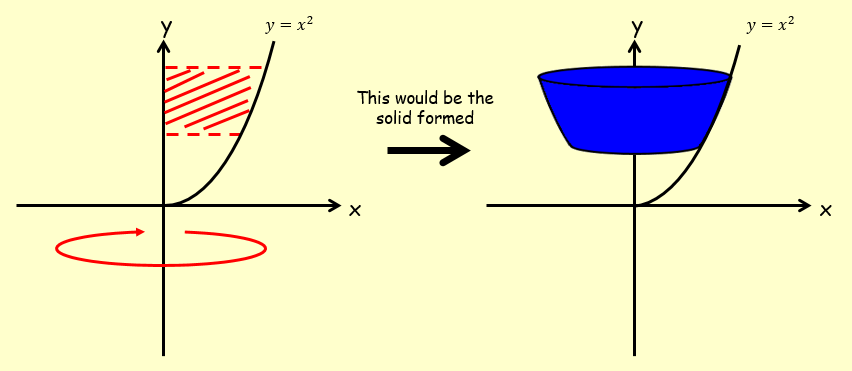
1. The diagram shows the region which is bounded by the x-axis, the y-axis and the curve with equation .

The region is rotated through 360˚ about the x-axis.

Find the exact volume of the solid generated.



**5B Rotations Around the y-axis**

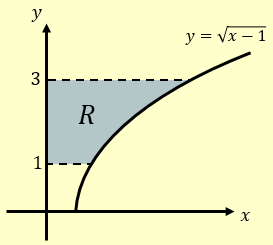


1. The diagram shows the curve with equation .

The region R is bounded by the curve, the y axis and the lines and .

The region is rotated 360˚ about the y axis.

Find the volume of the solid generated.

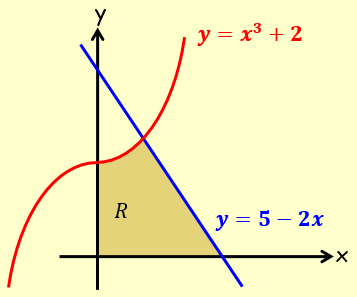


**5C Composite Volumes of Revolution**

Cylinder =

Cone =

1. The region R is bounded by the curve with equation , the line , and the x and y axes.
2. Verify that the coordinates of A are (1,3)

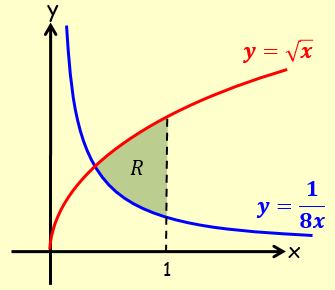


1. A solid is created by rotating the region 360˚ about the x-axis. Find the volume of this solid
2. The diagram shows the region R bounded by the curves with equations:

and and the line .

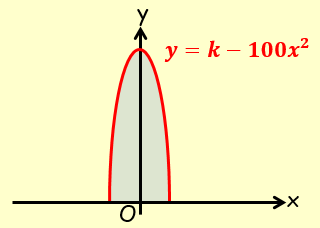
The region is rotated through 360˚ about the x-axis.

Find the exact volume of the solid generated.



**5D Modelling with Volumes of Revolution**

1. A manufacturer wants to cast a prototype for a new design for a pen barrel made out of solid resin. The shaded region shown in the diagram is used as a model for the cross section of the pen barrel. The region is bounded by the x-axis and the curve with equation , and will be rotated around the y-axis. Each unit on the coordinate axes represents 1cm.



1. Suggest a suitable value for k
2. Use your value of k to estimate the volume of resin needed to make the prototype
3. State one limitation of this model