**Volumes of revolution for parametric curves**

We have seen in Pure Year 2 that parametric equations are where, instead of some single equation relating and , we have an equation for each of and in terms of some parameter, e.g. . As varies, this generates different points .

**To integrate parametrically, the trick was to replace with**

Note that as we’re integrating with respect to now, we need to find the equivalent limits for . We can do the same for revolving around the -axis: just replace with and change the limits.

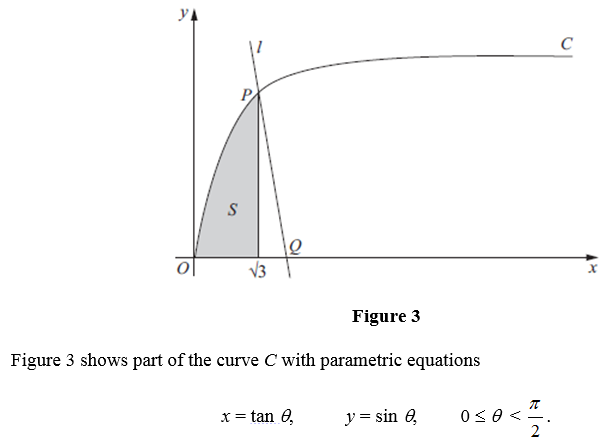
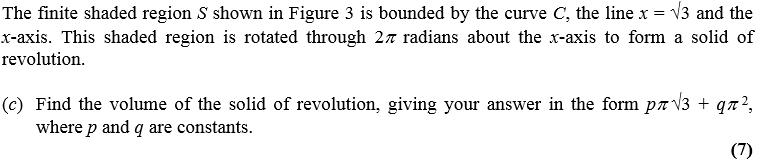
Example

The curve has parametric equations , , .

The region is bounded by , the -axis and the lines and . Find the exact volume of the solid formed when is rotated radians about the -axis.

Test Your Understanding

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