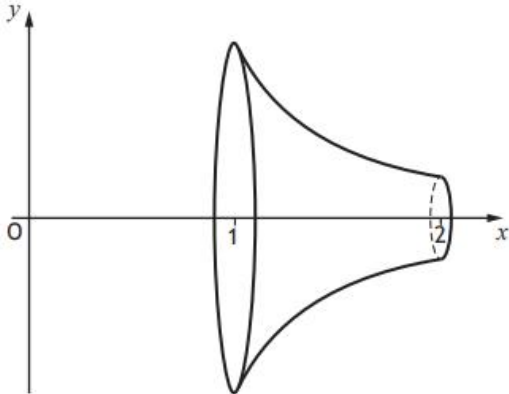
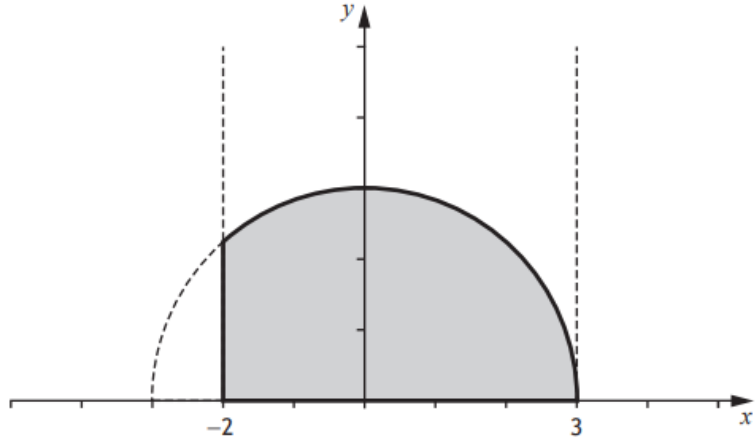
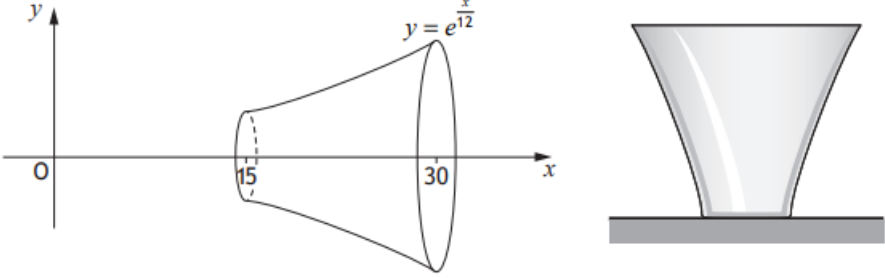
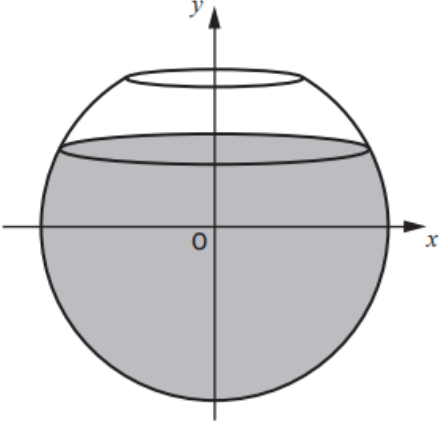


Y	Q	Volume of Revolution
2022	9	<p>An object is formed by rotating the curve <math>y = \frac{6x}{3x^3 - 1}</math> between <math>x = 1</math> and <math>x = 2</math>, through <math>2\pi</math> radians about the <math>x</math>-axis.</p>  <p>Using the substitution <math>u = 3x^3 - 1</math>, or otherwise, find the exact value of the volume of this object.</p>
2018	6	<p>A part of the graph of <math>x^2 + y^2 = 9</math> is shown in the diagram below.</p>  <p>The shaded area is bounded by the graph, the <math>x</math>-axis and the lines <math>x = -2</math> and <math>x = 3</math>. This area is rotated <math>360^\circ</math> about the <math>x</math>-axis.</p> <p>Calculate the volume of the solid formed by this rotation.</p>

6

4

2016	13	<p>A glass bowl is modelled by rotating the curve <math>y = e^{\frac{x}{12}}</math> between <math>x=15</math> and <math>x=30</math> through <math>2\pi</math> radians about the <math>x</math>-axis as shown in the diagram.</p>  <p>(a) Find the volume of the bowl. <span style="float: right;">3</span></p> <p>(b) A line is to be put on the bowl to indicate when it is half full. How far above the base of the bowl should this line be marked? <span style="float: right;">3</span></p>
2016 Spec	11	<p>A flower vase is modelled by rotating part of the curve <math>x = \sqrt{100 - y^2}</math> through <math>2\pi</math> radians about the <math>y</math>-axis as shown in the diagram.</p>  <p>(a) Find the volume of water needed to fill the vase to a depth of 16 cm. <span style="float: right;">4</span></p> <p>(b) State <b>one</b> improvement that could be made to the design <span style="float: right;">1</span></p>