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EXERCISE SHEET: VOLUMES OF REVOLUTION

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1. Let  $R$  be the region bounded by the lines  $x + y = 8$ ,  $x = 0$  and  $y = 0$ . Find the volume of the solid obtained by rotating  $R$  around the  $x$ -axis
2. Let  $R$  be the region bounded by the curve  $x^2 - y^2 = 9$  and the lines  $x + y = 9$ ,  $y = 0$  and  $x = 0$ . Find the volume of the solid obtained by rotating  $R$  around the  $x$ -axis.
3. Let  $R$  be the region bounded by the curve  $y = \frac{1}{\sqrt{x+1}}$  and the lines  $x = 0$  and  $y = \frac{1}{2}$ . Compute the volume of the solid obtained by rotating  $R$  around the  $y$ -axis.
4. Let  $R$  be the region bounded by the curve  $y = \sqrt{x}$  and the lines  $x = 4$  and  $y = 0$ . Compute the volume of the region obtained by rotating  $R$  around the  $y$ -axis.
5. Let  $R$  be the region bounded by the curve  $x = e^{-y}$  and by the lines  $y = 0$  and  $y = 3$ . Compute the volume of the solid obtained by rotating  $R$  around the  $y$ -axis.
6. Let  $R$  be the region bounded by the curves  $y = \sin(x)$  and  $y = 5\sin(x)$  and by the lines  $x = 0$  and  $x = \pi$ . Compute the volume of the solid obtained by rotating  $R$  around the  $x$ -axis.