**3.** The finite region enclosed by the curve with equation $y = 3 - \sqrt{x}$ and the lines $x = 0$ and $y = 0$ is rotated through $2\pi$ radians about the $x$-axis, to form a uniform solid $S$.

Use algebraic integration to

(a) show that the volume of $S$ is $\frac{27}{2}\pi$

**(4)**

(b) find the $x$ coordinate of the centre of mass of $S$.

**(5)**

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

**Question 3 continued**

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

**Question 3 continued**

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

**Question 3 continued**

**(Total for Question 3 is 9 marks)**

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA