



The diagram shows the curve $y = \sin^3 x \sqrt{(\cos x)}$ for $0 \leq x \leq \frac{1}{2}\pi$, and its maximum point M .

- (i) Using the substitution $u = \cos x$, find by integration the exact area of the shaded region bounded by the curve and the x -axis. [6]
- (ii) Showing all your working, find the x -coordinate of M , giving your answer correct to 3 decimal places. [6]