



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

- (a) Using the substitution $u = \sin x$, find the exact area of the region bounded by the curve and the x -axis. [5]
- (b) Find the exact x -coordinate of M . [6]