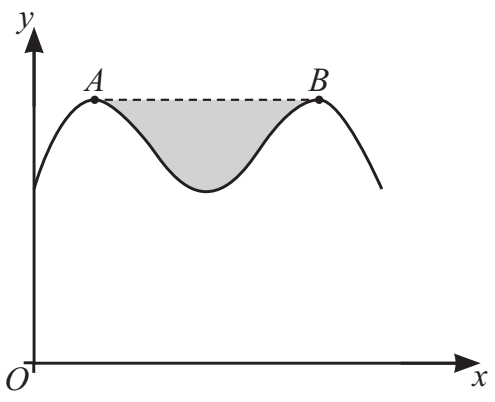
**5**




The diagram shows the curve with equation $y = 4\cos 2x + 8\sin x$ for $0 \leqslant x \leqslant \pi$. The maximum points on the curve are denoted by $A$ and $B$, and the shaded region is bounded by the line segment $AB$ and the curve.

**(a)** Find the coordinates of $A$ and $B$. [5]

**(b)** Find the exact area of the shaded region. [6]