The diagram shows the curve with equation $y = 3 \sin x - 3 \sin 2x$ for $0 \leqslant x \leqslant \pi$. The curve meets the x-axis at the origin and at the points with x-coordinates a and π.

(a) Find the exact value of a. [3]

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(b) Find the area of the shaded region. [4]

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