| 15 (a) | Show that | |
|--------|---|-----------|
| | $\sin x - \sin x \cos 2x \approx 2x^3$ | |
| | for small values of x . | [3 marks] |
| | | |
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| | | |
| 15 (b) | Hence, show that the area between the graph with equation | |
| | $y = \sqrt{8(\sin x - \sin x \cos 2x)}$ | |
| | the positive x -axis and the line $x = 0.25$ can be approximated by | |
| | Area $\approx 2^m \times 5^n$ | |
| | where m and n are integers to be found. | [4 marks] |
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| | | |



Do not write outside the box

| 15 (c) (i) | Explain why |
|------------|---|
| | is not a suitable approximation for $\int_{6.3}^{6.4} 2x^3 \mathrm{d}x$ $\int_{6.3}^{6.4} (\sin x - \sin x \cos 2x) \mathrm{d}x$ [1 mark] |
| | Question 15 continues on the next page |



| 15 (c) (ii) | Explain how |
|-------------|--|
| | $\int_{6.3}^{6.4} (\sin x - \sin x \cos 2x) \mathrm{d}x$ |
| | may be approximated by |
| | $\int_{a}^{b} 2x^{3} dx$ |
| | for suitable values of a and b . [2 marks] |
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END OF QUESTIONS