

6 **Fig. 6** shows a partially completed spreadsheet.

This spreadsheet uses the trapezium rule with four strips to estimate  $\int_0^{\frac{1}{2}\pi} \sqrt{1 + \sin x} \, dx$ .

|          | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> | <b>E</b> |
|----------|----------|----------|----------|----------|----------|
| <b>1</b> |          | $x$      | $\sin x$ | $y$      |          |
| <b>2</b> | 0        | 0.0000   | 0.0000   | 1.0000   | 0.5000   |
| <b>3</b> | 0.125    | 0.3927   | 0.3827   | 1.1759   | 1.1759   |
| <b>4</b> | 0.25     | 0.7854   | 0.7071   | 1.3066   | 1.3066   |
| <b>5</b> | 0.375    | 1.1781   | 0.9239   | 1.3870   | 1.3870   |
| <b>6</b> | 0.5      | 1.5708   | 1.0000   | 1.4142   | 0.7071   |
| <b>7</b> |          |          |          |          | 5.0766   |
| <b>8</b> |          |          |          |          |          |

**Fig. 6**

(a) Show how the value in cell B3 is calculated. [1]

(b) Show how the values in cells D2 to D6 are used to calculate the value in cell E7. [1]

(c) Complete the calculation to estimate  $\int_0^{\frac{1}{2}\pi} \sqrt{1 + \sin x} \, dx$ .  
Give your answer to 3 significant figures. [2]