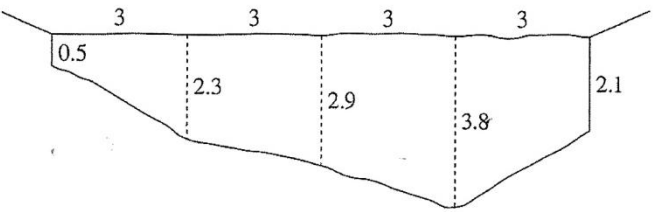


Want more revision exercises? Get [MathsFit](#) - New from projectmaths.

<b>12</b>	<b>12 d</b>	<p>At a certain location a river is 12 metres wide. At this location the depth of the river, in metres, has been measured at 3 metre intervals. The cross-section is shown.</p>  <p>(i) Use Simpson's rule with the five depth measurements to calculate the approximate area of the cross-section.</p> <p>(ii) The river flows at 0.4 metres per second. Calculate the approximate volume of water flowing through the cross-section in 10 seconds.</p>	<b>3</b>
		<p>(i)</p> $A \approx \frac{h}{3} [y_0 + y_n + 4(y_1 + y_3) + 2y_2]$ $\approx \frac{3}{3} [0.5 + 2.1 + 4 \times [2.3 + 3.8] + 2 \times 2.9]$ $\approx 32.8$ <p><math>\therefore</math> area of approximately 32.8 m<sup>2</sup></p> <p>(ii) As <math>10 \times 0.4 = 4</math>,</p> $\text{Volume} = 32.8 \times 4$ $= 131.2$ <p><math>\therefore</math> volume is approximately 131.2 m<sup>3</sup></p>	<p>State Mean:</p> <p><b>2.37/3</b></p> <p><b>0.49/1</b></p>

\* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by the Board of Studies

### Board of Studies: Notes from the Marking Centre

- (i) In the majority of responses, candidates correctly used the five function values, often in a table, to find the approximate area. In weaker responses, common errors included the use of function notation in the quoted formula with incorrect substitution, incorrect weightings and missing brackets. Numerical errors were also common, highlighting the need to show full substitution before any numerical evaluation. A small number of candidates applied the Trapezoidal rule rather than Simpson's rule.
- (ii) In better responses, candidates who recognised that  $V = Ah$  usually succeeded with this part. In many responses, candidates attempted to answer this question using calculus and were unsuccessful.

Source: [http://www.boardofstudies.nsw.edu.au/hsc\\_exams/](http://www.boardofstudies.nsw.edu.au/hsc_exams/)