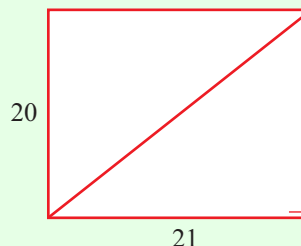


**AREA & VOLUME (Q 1, PAPER 2)**

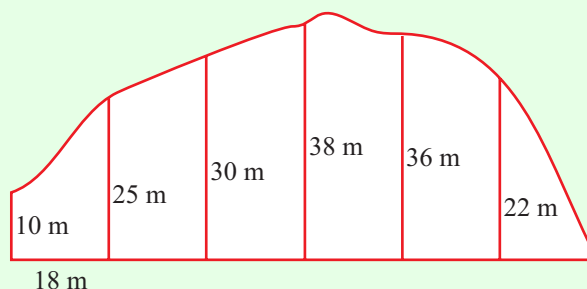
**2005**

1 (a) A rectangle has length 21 cm and width 20 cm.

- (i) Find the area of the rectangle.
- (ii) Find the length of the diagonal.



(b) The sketch shows a lake bounded on one side by a straight dam.



At equal intervals of 18 m along the dam, perpendicular measurements are made to the opposite bank, as shown on the sketch.

- (i) Use Simpson's Rule to estimate the area of the lake.
  - (ii) If the lake contains 15 000 m<sup>3</sup> of water, calculate the average depth of water in the lake, correct to the nearest metre.
- (c) A steel-works buys steel in the form of solid cylindrical rods of radius 10 centimetres and length 30 metres. The steel rods are melted to produce solid spherical ball-bearings. No steel is wasted in the process.
- (i) Find the volume of steel in one cylindrical rod, in terms of  $\pi$ .
  - (ii) The radius of a ball-bearing is 2 centimetres. How many such ball-bearings are made from one steel rod?
  - (iii) Ball-bearings of a different size are also produced. One steel rod makes 225 000 of these new ball-bearings. Find the radius of the new ball-bearings.

**ANSWERS**

- |   |                                       |                             |
|---|---------------------------------------|-----------------------------|
| 1 | (a) (i) 420 cm <sup>2</sup>           | (ii) 29 cm                  |
|   | (b) (i) 2,892 m <sup>2</sup>          | (ii) 5 m                    |
|   | (c) (i) 300,000 $\pi$ cm <sup>3</sup> | (ii) 28,125      (iii) 1 cm |