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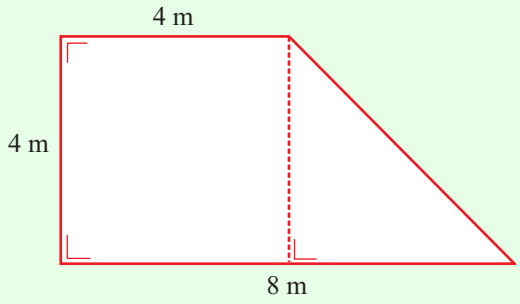
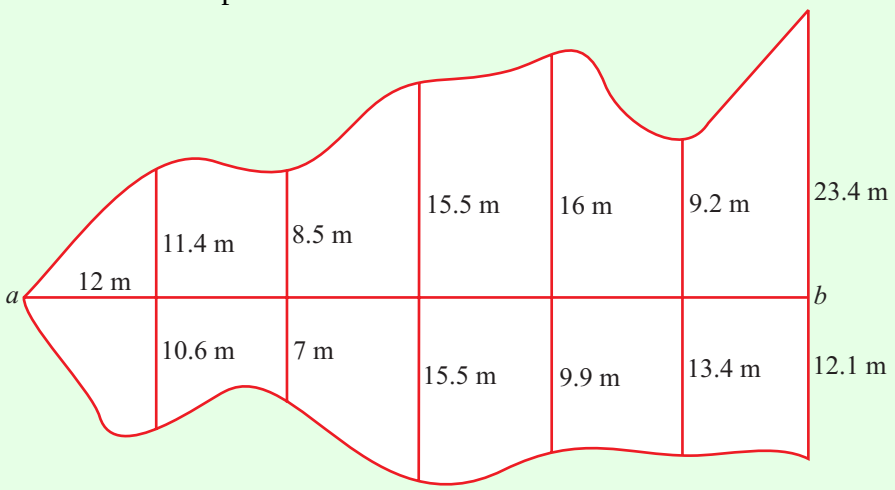
Area & Volume (Q 1, Paper 2)

2004

1 (a) Calculate the area of the figure in the diagram.



(b) The sketch shows a piece of land.



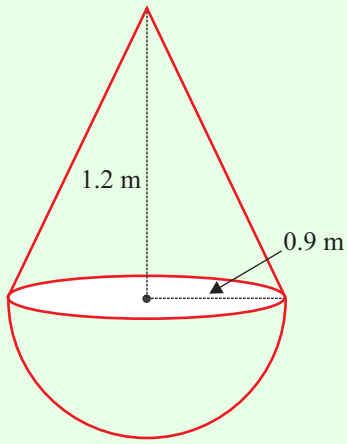
At equal intervals of 12 m along [*ab*], perpendicular measurements are made to the boundary, as shown on the sketch.
Use Simpson's Rule to estimate the area of the piece of land.

(c) A buoy at sea is in the shape of a hemisphere with a cone on top, as in the diagram.
The radius of the base of the cone is 0.9m and its vertical height is 1.2 m.

(i) Find the vertical height of the buoy.

(ii) Find the volume of the buoy, in terms of π.

(iii) When the buoy floats, 0.8 m of its height is above water. Find, in terms of π, the volume of that part of the buoy that is above the water.



Answers

1 (a) 24 m^2
(b) 1682.8 m^2
(c) (i) 2.1 m (ii) $0{\cdot}81\pi$ m^3 (iii) $0{\cdot}096\pi$ m^3