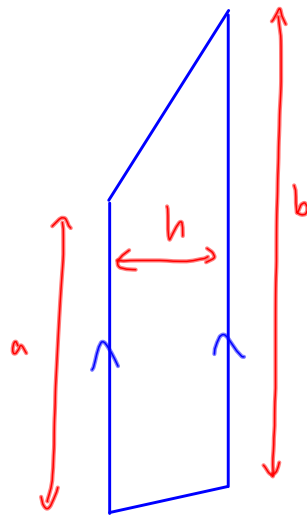
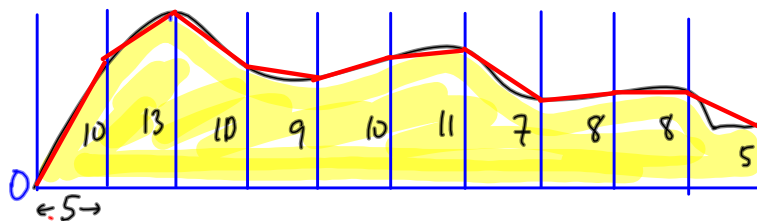


## Trapezoid (Trapezium)



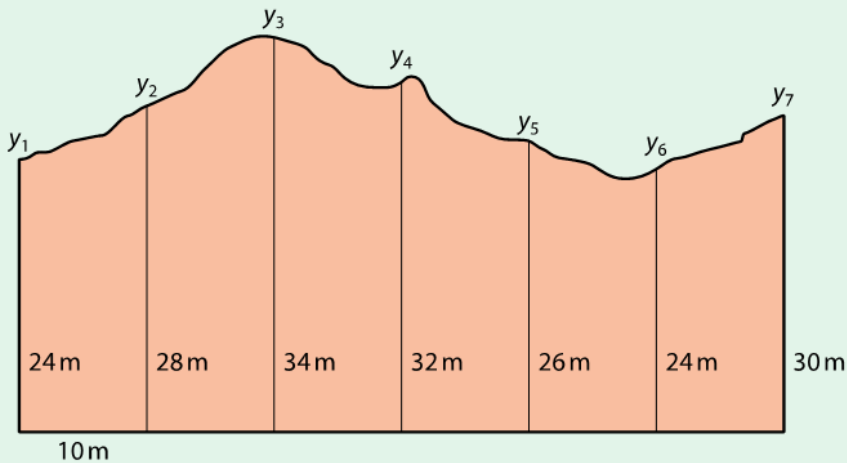
$$\Delta = \left( \frac{a+b}{2} \right) h$$

Using Trapezium to estimate area



$$\begin{aligned} \Delta &= \frac{(0+10)}{2} 5 + \frac{(10+13)}{2} 5 + \frac{(13+10)}{2} 5 + \dots \\ &= \frac{5}{2} [0 + 10 + 10 + 13 + 13 + 10 + 10 \dots] \\ &= \frac{5}{2} [0 + 5 + 2 [10 + 13 + 10 + 9 + 10 + 11 + 7 + 8 + 8]] \\ &= \end{aligned}$$

Find the area of the shape shown in the diagram below, given that the width of each strip is 10 m. The lengths of the ordinates are given.



\* Trapezoidal Rule

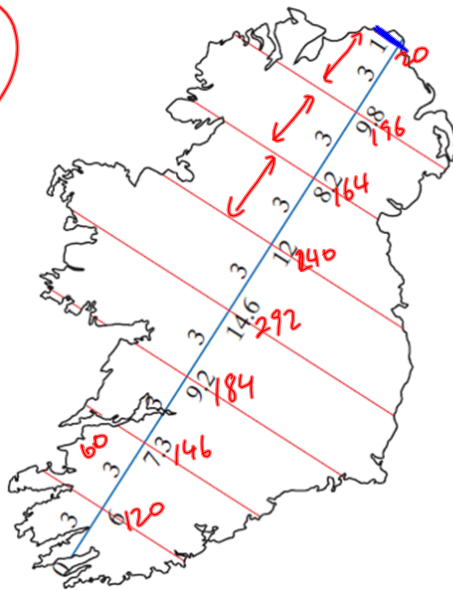
$$\Delta \approx \frac{h}{2} [\text{First} + \text{Last} + 2(\text{others})]$$

$$\approx \frac{10}{2} [24 + 30 + 2[28 + 34 + 32 + 26]]$$

$$\approx 1710 \text{ m}^2$$

6. An outline of the map of Ireland is given. If the scale used is  $\underline{1 \text{ cm}} = \underline{20 \text{ km}}$ , use the trapezoidal rule to estimate the area of the island of Ireland. Offsets are taken every 3 cm.

Section 6.4



$$\Delta = \frac{3}{2} [0 + 1 + 2(6 + 7.3 + 9.2 + 14.6 + 12 + 8.2 + 9.8)]$$

$$= 202.8 \text{ cm}^2 = 81120 \text{ km}^2$$