

# Quantitative Methods

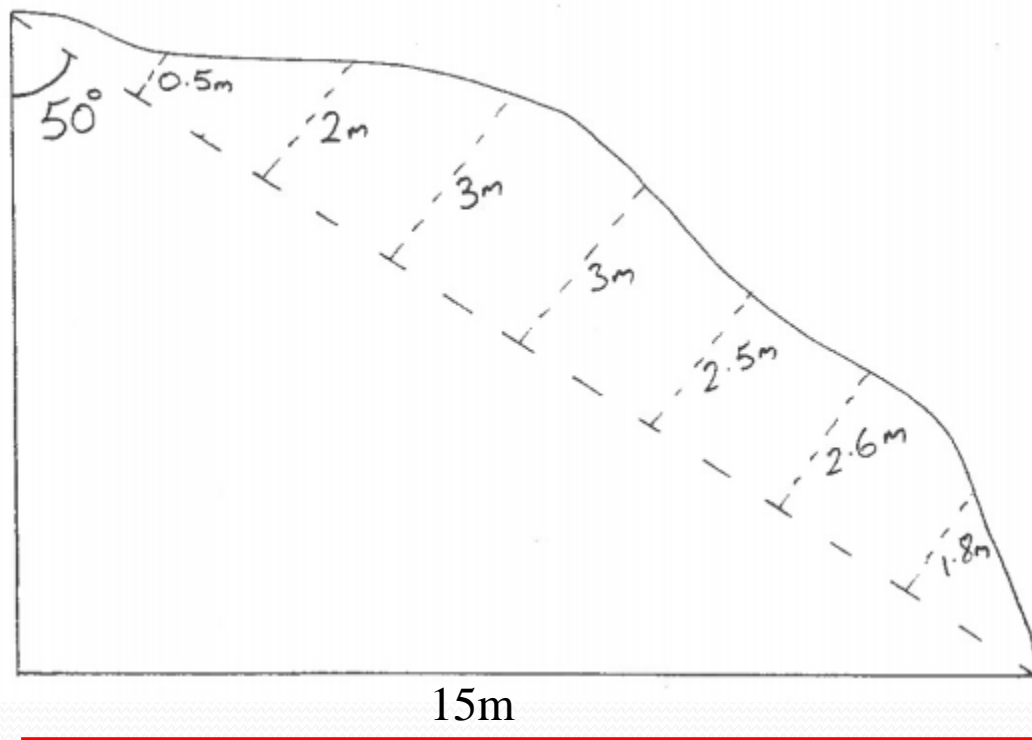
## Simpson's Rule Irregular Areas

Module No. Cons 1012

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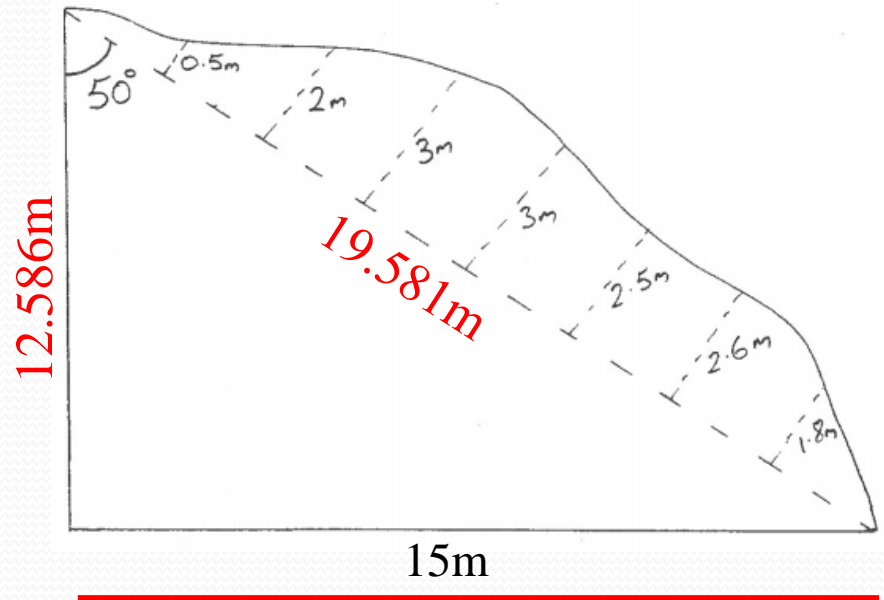
# Simpson's Rule Irregular Areas

- First you need the two side lengths of the triangle in order to get area.
- Then when you have established the long length (HYP) you can work out the irregular area using Simpson's Rule.
- Area =  $W/3 \{ (\text{first} + \text{last}) + 4 (\text{evens}) + 2 (\text{odds}) \}$



# Irregular Areas

- First we need two side lengths of the triangle. Opp/Hyp
- $\sin 50^\circ = 15/X$
- $0.766 = 15/X$
- $X = 15 \div 0.766$
- $X = 19.581\text{m}$



- $a^2 + b^2 = c^2$
- $a^2 = c^2 - b^2$
- $x^2 = 19.581^2 - 15^2$
- $x^2 = 383.42 - 225$
- $x = \sqrt{158.42}$
- **$x = 12.586\text{m}$**

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= 0.5 \times 15 \times 12.586 \\ &= 94.3987\text{m}^2\end{aligned}$$

# Irregular Areas

- Irregular Area =  $\frac{W}{3} \{ (\text{first} + \text{last}) + 4 (\text{evens}) + 2 (\text{odds}) \}$
- =  $\frac{2.448}{3} \{ (0 + 0) + 4 (0.5+3+2.5+1.8) + 2 (2+3+2.6) \}$
- =  $\frac{2.448}{3} \{ (0) + 4 (7.8) + 2 (7.6) \}$
- =  $\frac{2.448}{3} \{ 0 + 31.2 + 15.2 \}$
- =  $\frac{2.448 \times 46.4}{3}$
- =  $37.8624\text{m}^2$
- **Total Area =  $94.3987 + 37.8624 = 132.2611\text{m}^2$**

