

Higher Maths  
SQA 2015 Paper 2  
Question 9



---

The blades of a wind turbine are turning at a steady rate.

The height,  $h$  metres, of the tip of one of the blades above the ground at time,  $t$  seconds, is given by the formula

$$h = 36\sin(1.5t) - 15\cos(1.5t) + 65.$$

Express  $36\sin(1.5t) - 15\cos(1.5t)$  in the form

$$k\sin(1.5t - a), \text{ where } k > 0 \text{ and } 0 < a < \frac{\pi}{2},$$

and hence find the **two** values of  $t$  for which the tip of this blade is at a height of 100 metres above the ground during the first turn.

8

---

Answer:

$$t = 1.006, t = 1.615$$