

8.

**In this question you must show all stages of your working.
Solutions relying entirely on calculator technology are not acceptable.**

- (i) Solve, for $0 < \theta \leq 270^\circ$, the equation

$$2 \tan \theta - 5 \sin \theta \cos \theta = 0$$

giving your answers, in degrees, to one decimal place where appropriate.

(5)

- (ii) The height above the ground, H metres, of a passenger on a fairground ride, t seconds after the start of the ride is modelled by the equation

$$H = 40 \sin(0.3t + 2)^\circ \quad 0 \leq t \leq 590$$

Use the equation of the model to answer parts (a) and (b).

- (a) Find the initial height of the passenger above the ground.

(2)

The passenger is exactly 25 metres above the ground for the second time T seconds after the start of the ride.

- (b) Find the value of T .

(4)