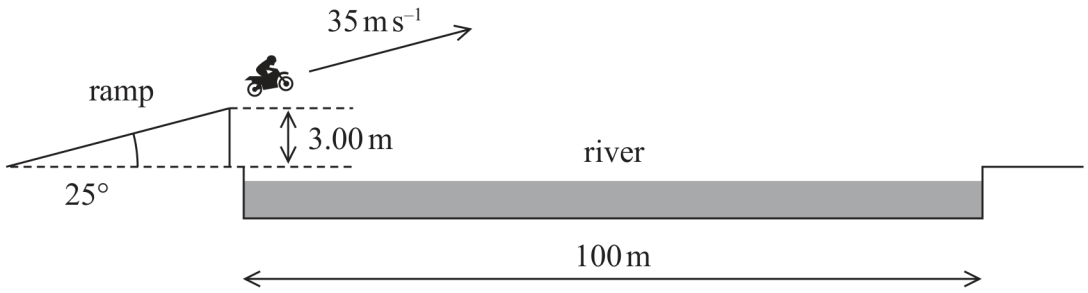
18 A stunt motorcyclist wants to jump across a river to land on the other side. The diagram shows the motorcyclist driving off a ramp at the edge of a river.



The ramp is at an angle of 25° to the horizontal and the height at the end of the ramp is 3.0 m. The width of the river is 100 m. The initial velocity of the motorcyclist is 35 m s^{-1}.

(a) Calculate the horizontal and vertical components of the motorcycle's initial velocity as it leaves the ramp.

(2)

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Horizontal component = ...

Vertical component = ...

(b) Deduce whether the rider lands on the other side of the river.

The effects of air resistance can be ignored.

(4)

(c) Explain how air resistance would affect the jump.

(3)

(Total for Question 18 = 9 marks)