Exam Questions - Projectile Motion

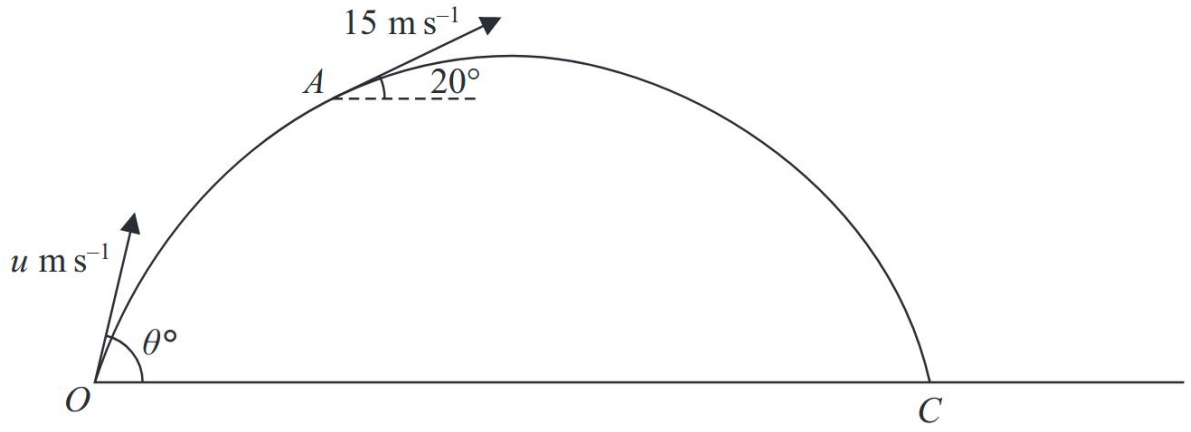
1. A boy throws a small ball at a vertical wall. The ball is thrown horizontally, from a point O, at a speed of 14.4 ms^{-1} and it hits the wall at a point which is 0.2 m below the level of O.

(a) Find the horizontal distance from O to the wall. [4 marks]

The boy now moves so that he is 6m from the wall. He throws the ball at an angle of 15° above the horizontal. The ball again hits the wall at a point which is 0.2 m below the level from which it was thrown.

(b) Find the speed at which the ball was thrown. [6 marks]
OCR June 2012

2. At time t = 0, a particle is projected from a fixed point O on horizontal ground with speed u ms^{-1} at an angle θ° to the horizontal. The particle moves freely under gravity and passes through the point A when t = 4 s. As it passes through A, the particle is moving upwards at 20° to the horizontal with speed 15 ms^{-1}, as shown in the diagram below.



(a) Find the value of u and the value of θ. [7 marks]

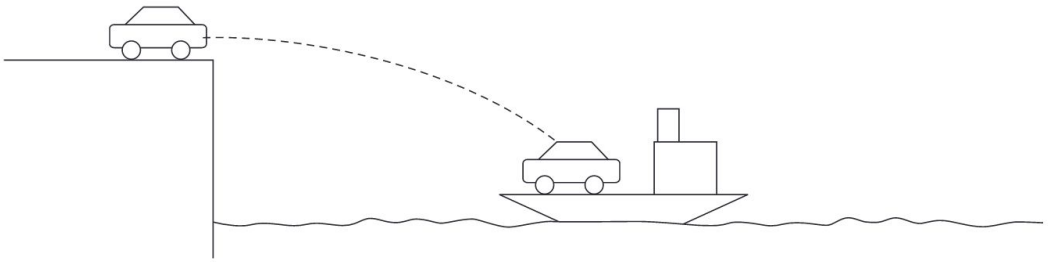
At the point B on its path the particle is moving downwards at 20° to the horizontal with speed 15 ms^{-1}.

(b) Find the time taken for the particle to move from A to B. [2 marks]

The particle reaches the ground at the point C.

(c) Find the distance OC. [3 marks]
Edexcel June 2015

3. In a scene from an action movie, a car is driven off the edge of a cliff and lands on the deck of a boat in the sea, as shown in the diagram.



To land on the boat, the car must move 20 metres horizontally from the cliff. The level of the deck of the boat is 8 metres below the top of the cliff. Assume that the car is a particle which is travelling horizontally when it leaves the top of the cliffand that the car is not affected by air resistance as it moves.

(a) Find the time that it takes for the car to reach the deck of the boat. [3 marks]

(b) Find the speed at which the car is travelling when it leaves the top of the cliff. [3 marks]

(c) Find the speed of the car when it hits the deck of the boat. [4 marks]
AQA June 2013