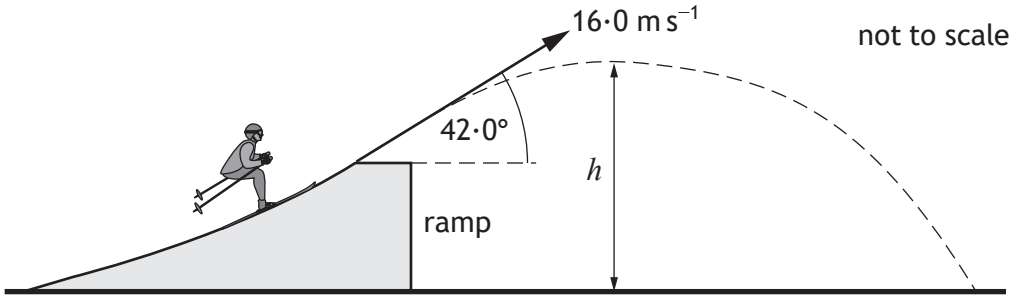
Total marks — 130

Attempt ALL questions

1. A skier launches from a ramp. The skier leaves the ramp with a launch velocity of 16·0 m s^{-1} at 42·0° to the horizontal.



The effects of air resistance can be ignored.

(a) Calculate

(i) the horizontal component of the launch velocity of the skier **1**

Space for working and answer

(ii) the vertical component of the launch velocity of the skier. **1**

Space for working and answer

MARKS | DO NOT WRITE IN THIS MARGIN

(b) Calculate the time taken for the skier to reach the maximum height h after launch. **3**

Space for working and answer

(c) The skier takes a further 1·40 s to travel from the maximum height h to the ground.

Determine the horizontal distance the skier travels from leaving the ramp until landing. **3**

Space for working and answer

(d) State how the value of the kinetic energy of the skier just before landing on the ground compares to their kinetic energy as they leave the ramp.

Justify your answer. **2**