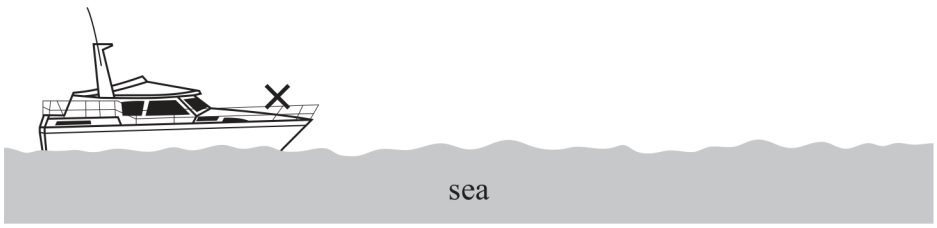
17 A distress flare may be launched from a boat, to signal for help.

(a) A flare was launched from a stationary boat at an angle of 30° to the horizontal.

(i) The flare was launched to the right from the launch position marked × on the boat in the diagram below.

Complete the diagram to show the path taken by the flare before it hit the sea.

(1)



(ii) The maximum height of the flare above the launch position was 42 m.

Show that the flare was launched at a speed of about 60 m s^{-1}.

(3)

(iii) The flare was visible from a maximum distance of 8 km. A rescue boat was 8.2 km from the boat in distress.

Determine whether the flare travelled a sufficient distance to be visible from the rescue boat. You should assume that the flare was launched in the direction of the rescue boat.

(4)

(b) State one assumption you made in (a)(iii).

(1)

(Total for Question 17 = 9 marks)