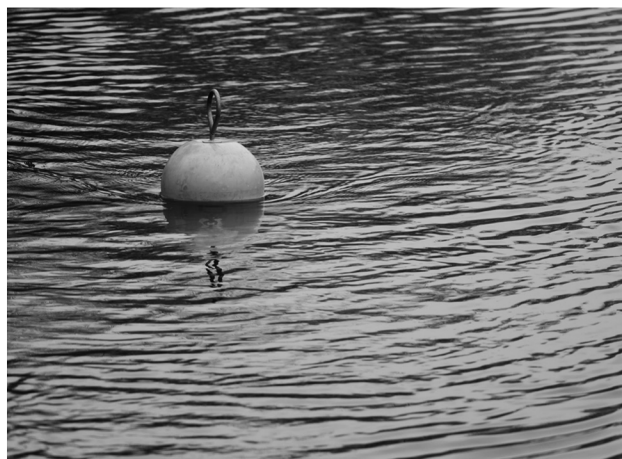
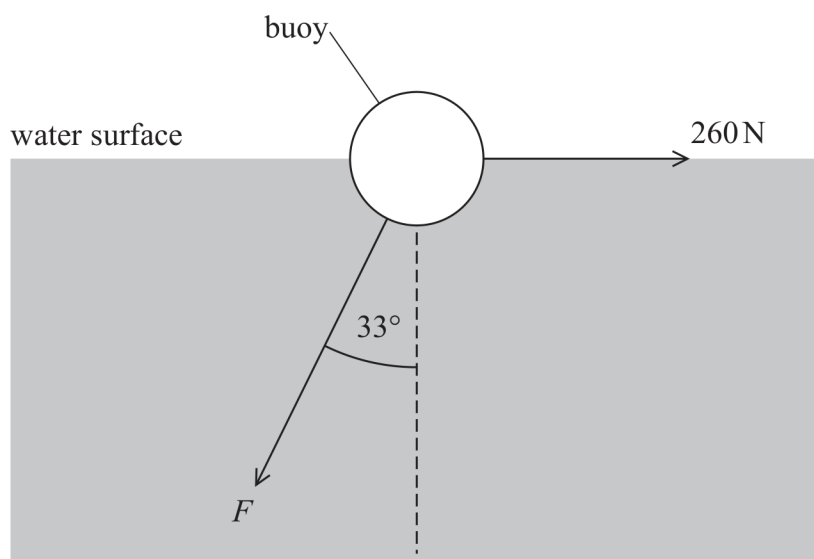


- 17 The photograph shows a floating object called a buoy. A long chain attaches the buoy to a very large mass at the bottom of the sea so that the buoy remains stationary.



(Source: © EThamPhoto/Alamy Stock Photo)

Water flowing past the buoy causes a horizontal force of 260 N on the buoy. The chain exerts a force F on the buoy at an angle of 33° to the vertical as shown.



- (a) (i) Show that F is about 500 N.

(2)

.....

.....

.....

.....

- (ii) The buoy floats due to the upthrust from the water.
The weight of water displaced by the buoy is 2.9 kN.

Determine the weight of the buoy.

(3)

Weight of buoy =

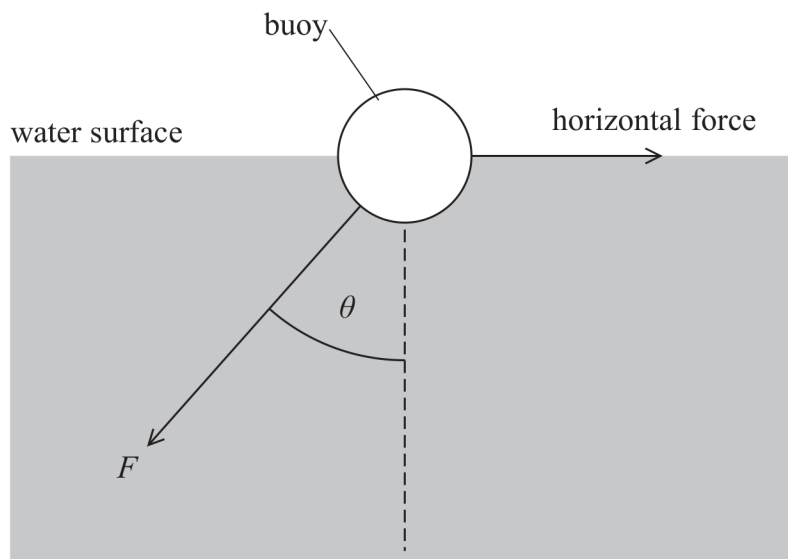
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- (b) The speed of the water flowing past the buoy increases, so the horizontal force increases. Assume that the weight of water displaced by the buoy does not change.



Explain how F and θ change when the horizontal force increases.

(3)