3 **(a)** State Newton's first law of motion.

.....

..... [1]

(b) A box slides down a slope, as shown in Fig. 3.1.

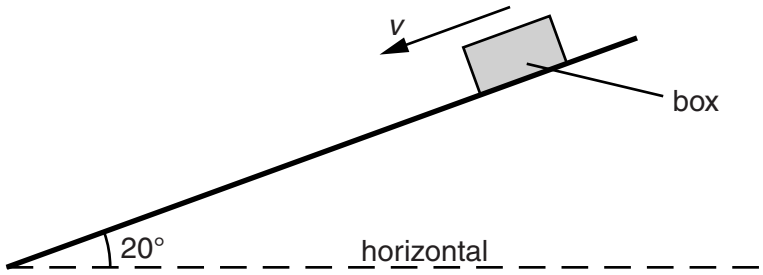

Fig. 3.1

The angle of the slope to the horizontal is 20°. The box has a mass of 65 kg. The total resistive force R acting on the box is constant as it slides down the slope.

(i) State the names and directions of the other two forces acting on the box.

1. .....

2. .....
[2]

(ii) The variation with time t of the velocity v of the box as it moves down the slope is shown in Fig. 3.2.

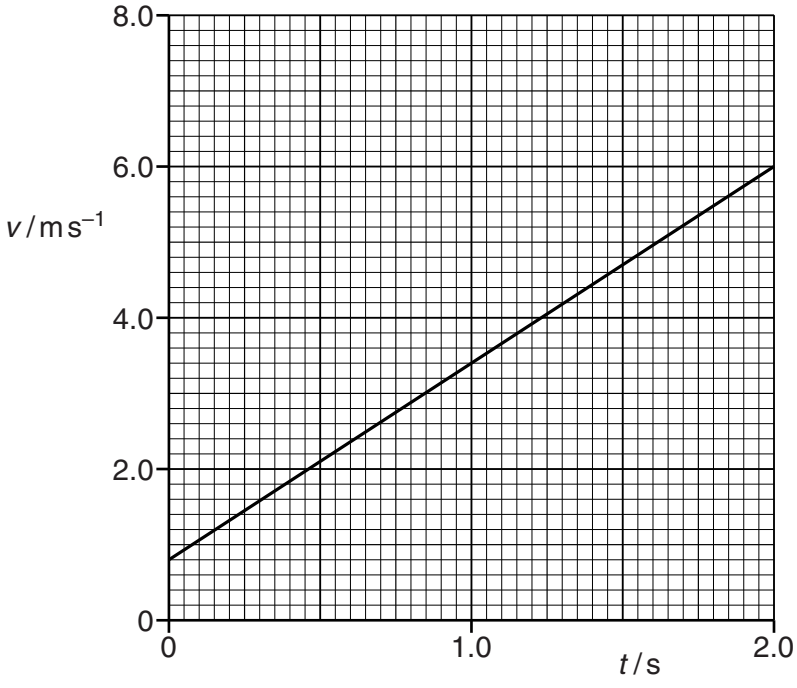

Fig. 3.2

1. data from Fig. 3.2 to show that the acceleration of the box is 2.6 $m\,s^{-2}$.

[2]

2. Calculate the resultant force on the box.

resultant force = ... N [1]

3. Determine the resistive force R on the box.

R = ... N [3]