2 A man stands inside a lift that was initially moving at constant speed before it starts to **decelerate** at t = 2.0 s. It comes to rest at t = 6.0 s. The reaction force R between his feet and the floor varies with time as shown in **Fig. 2.1**. For the sign convention, take the upward direction as positive.

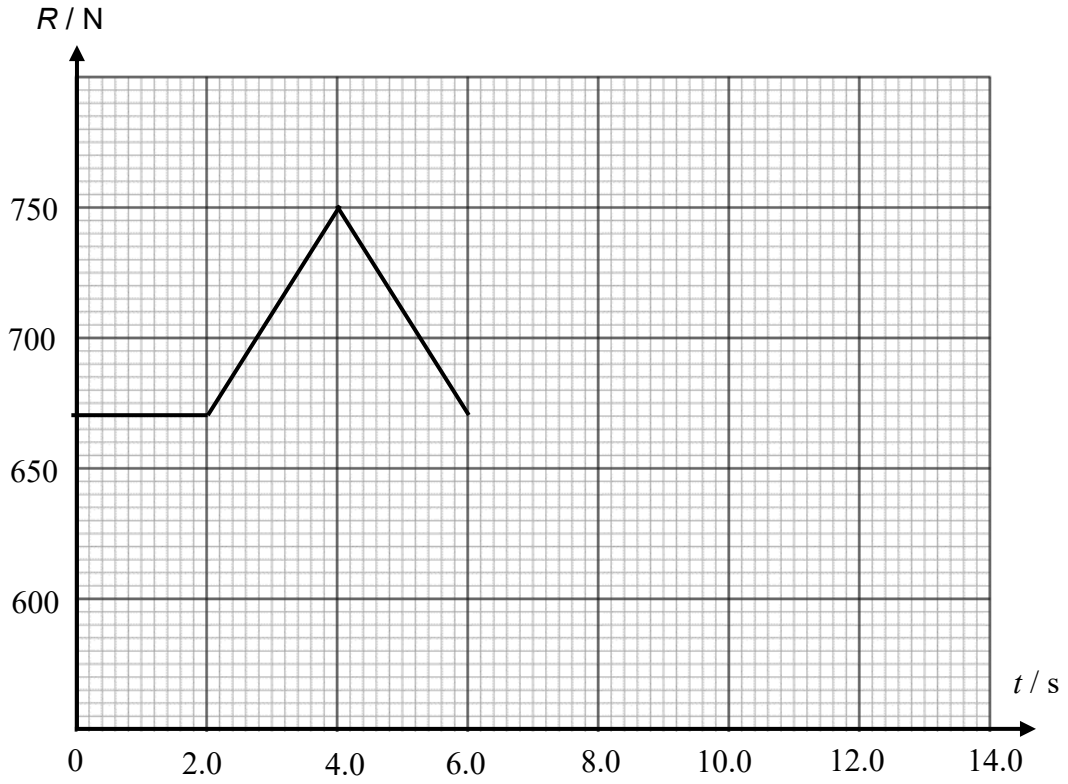

Fig. 2.1

(a) Determine the mass of the man.

Mass = …… kg [2]

(b) State and explain the direction of the motion of the man between t = 2.0 s and t = 6.0 s using Newton's 2nd Law.

……..

……..

……..

…… [2]

(c) Using **Fig. 2.1**, show that the initial speed of the lift is 2.34 m s^{-1}.

Initial speed = …… m s^{-1} [2]

At 10 s, the lift starts moving again, in the **same** direction.

(d) If the acceleration profile is the same as that of the deceleration between t = 2.0 s and t = 6.0 s, complete the graph on **Fig. 2.1** to show how the reaction force experienced by the man varies with time between t = 6.0 s and t = 14.0 s. [1]

The lift car has a mass of 1200 kg and is balanced by a counter-weight of mass 1320 kg, as shown in **Fig. 2.2**. Assume that no resistive forces are present to oppose the motion of the lift.

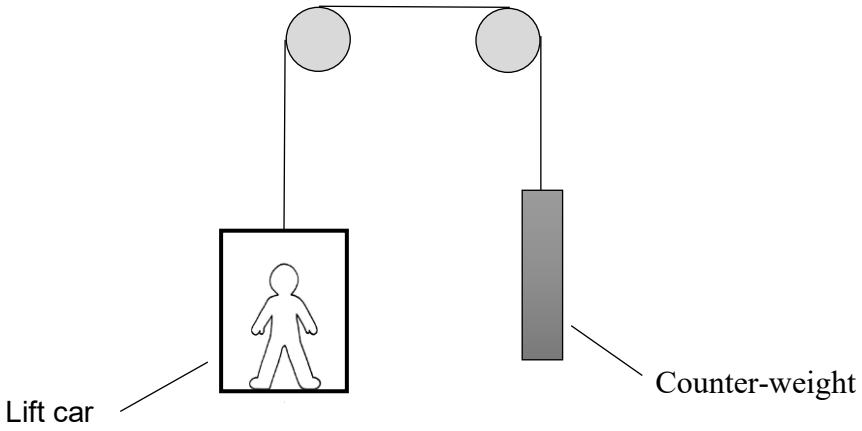

Fig. 2.2

(e) If the total mass of passsengers in the lift car is 420 kg and it is currently moving downwards with the constant speed calculated in **(c)**, calculate the power exerted by the lift motor.

Power = ……. W [3]