

 SCAN ME

CHECK YOUR ANSWERS

(1)

This image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a small, stylized blue gear-like icon.

1



- (2)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. In the bottom-left corner, there is a small blue gear-shaped icon. The rest of the page is empty.

2

- (b) Assuming that the frictional force remains constant, find the time taken for P to come to rest. (3)

This image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a small, stylized graphic of a blue gear or cogwheel.

3



- (2)

[illegible]

4

5

The lift starts from rest and accelerates vertically upwards at 1.5 ms^{-2} for 4 seconds.

- (a) Find the tension in the cable during these 4 seconds. (2)

- (b) Find the speed of the lift after 4 seconds. (1)

The lift then continues to move vertically upwards but decelerates uniformly, coming to rest 3 seconds later.

- (c) Find the tension in the cable during the 3 seconds when the lift decelerates. (3)

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(Total for Question 5 is 6 marks)



- (d) Find the distance travelled by the car before it comes to rest. (2)

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6

7

A horizontal force of magnitude $4x$ N acts on P in the direction of motion. The frictional force acting on P has magnitude $2y$ N, where x and y are constants.

The magnitude of the normal reaction on P is $(3x + 7y)$ N.

Given that P accelerates at 4 ms^{-2} , find the values of x and y .

This image shows a full page of white paper with horizontal black ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a small blue circular logo with a gear-like or sunburst design.

(Total for Question 7 is 4 marks)



8

When $t = 3$,

- the weight of the ball is $2c^2$ N, where c is a constant
- the air resistance has magnitude $(17c - 30)$ N
- the acceleration of the ball is 0 ms^{-2}
- the speed of the ball is 30 ms^{-1}
- the ball is 18 m above the ground.

(a) Find two possible values of c .

(3)

(b) Given that the mass of the ball is less than 2 kg, find the mass of the ball.

(2)

After $t = 3$, the acceleration of the ball remains 0 ms^{-2}

(c) find the value of t when the ball hits the ground.

(2)

This image shows a full page of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a small blue circular logo with a gear-like border and some illegible text inside.

(Total for Question 8 is 7 marks)

