1 A student determines the diameter of a metal ball.

Which apparatus is needed to get an accurate measurement?

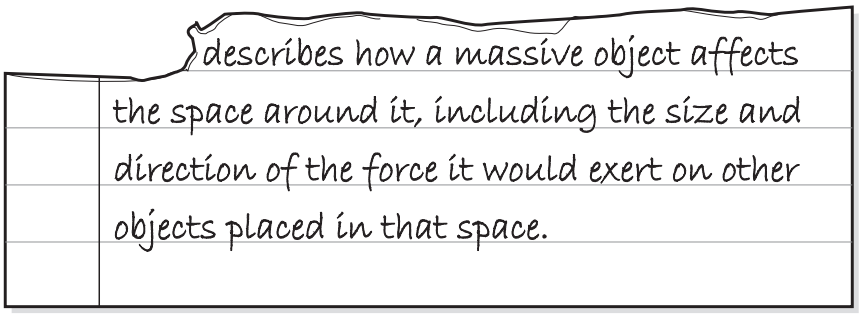
A a ruler and a protractor

B a ruler only

C a protractor and a set square

D a ruler and two rectangular blocks

3 A piece of paper torn out of an exercise book is shown.



What is being described?

A gravitational charge

B gravitational field

C gravitational mass

D gravitational potential energy

1 Which quantities are both vectors?

A acceleration and force

B acceleration and pressure

C density and force

D density and pressure

1 When a pendulum passes a marker, a timer displays 1 minute 30 seconds.

The pendulum passes the marker 12 more times from the same direction.

On the final pass, the timer displays a time of 2 minutes 18 seconds.

What is the time period of oscillation of the pendulum?

A 4.0 s **B** 4.4 s **C** 7.5 s **D** 12 s

1 (a) (i) State the difference between a scalar quantity and a vector quantity.

.....

..... [1]

(ii) In the list below, draw a line under each of the quantities that is a scalar quantity.

acceleration mass momentum electric field strength

energy temperature

[2]

(b) A tennis player throws a tennis ball into the air. The mass of the tennis ball is 5.8×10^{-2} kg. The tennis ball leaves the tennis player's hand and reaches a maximum height of 5.0 m above the point of release.

(i) Show that the initial velocity of the tennis ball is 9.9 m / s upwards.

[3]

(ii) Calculate the momentum of the tennis ball as it leaves the tennis player's hand.

momentum = ... [2]

[Total: 8]

1 **(a)** Circle the vector quantities in the list.

acceleration **mass** **speed** **time** **velocity**

[1]

(b) Fig. 1.1 shows the speed–time graph for a train travelling from station A to station B.

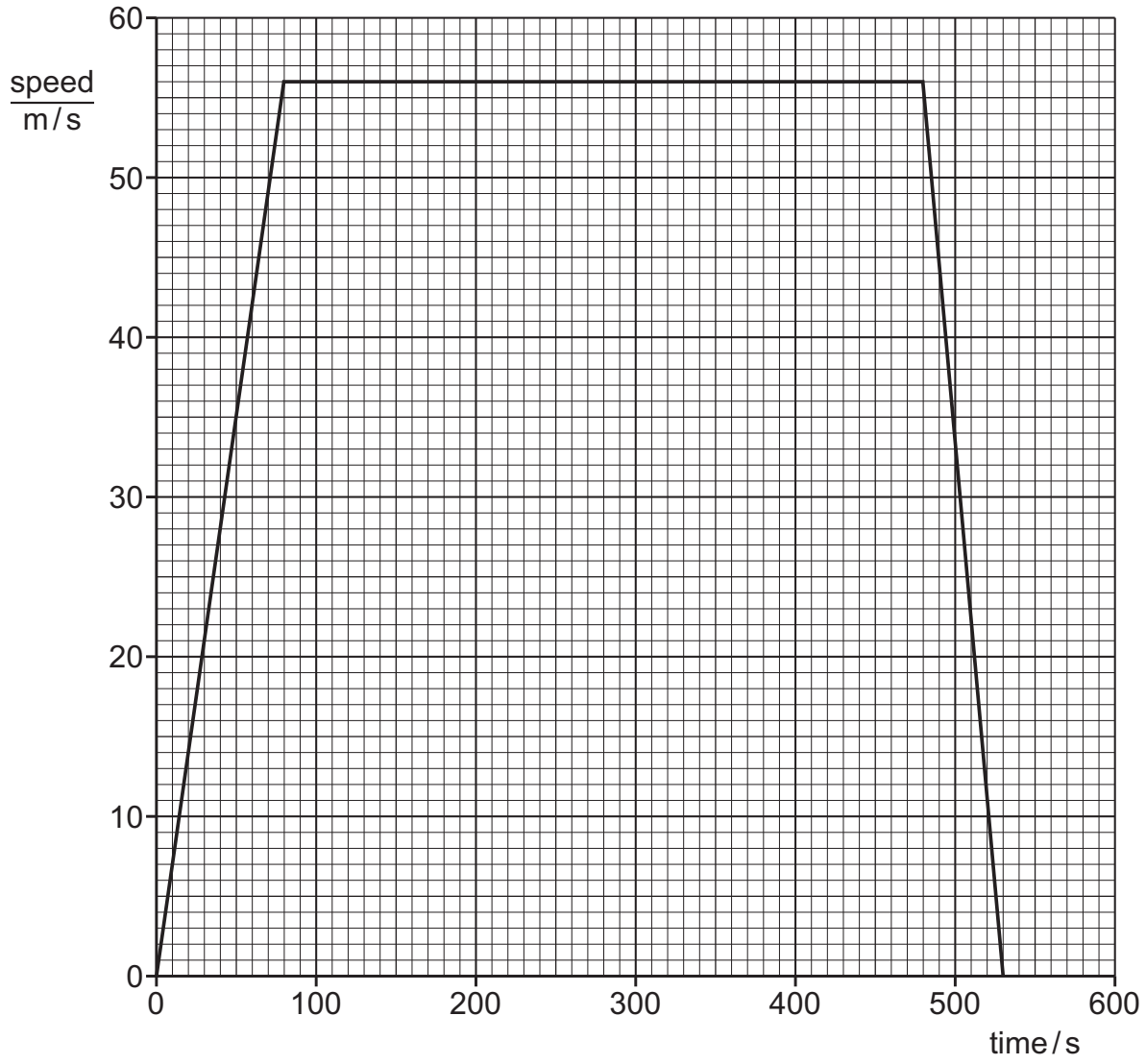


Fig. 1.1

(i) State the maximum speed of the train.

maximum speed = ... [1]

(ii) Describe the motion of the train between station A and station B.

.....

.....

..... [2]

(iii) Calculate the distance between station A and station B.

distance = ... [3]

(iv) On a different day, the train takes 650 s to travel between station A and station B.

Suggest **one** change to the motion of the train that leads to this longer journey time.

.....

..... [1]

[Total: 8]

IGCSE Physics: **s24 21**

1 In which row are quantities correctly categorised into scalar quantities and vector quantities?

	scalar quantities	vector quantities
A	mass and energy	weight and acceleration
B	gravitational field strength and time	force and electric field strength
C	speed and momentum	distance and force
D	distance and energy	velocity and temperature

IGCSE Physics: **w23 21**

1 Which is a vector quantity?

A density

B mass

C pressure

D weight