3.1 Mechanics: Quantities, Units and Kinematics: 10-minute Pack

EDEXCEL 9MA0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Convert a distance of 5.6 km into metres.

(Total for Question 1 is 1 mark)

2 A particle moves at a constant speed of 15 m/s for 6 seconds. Find the distance it travels.

(Total for Question 2 is 1 mark)

3 State whether each of the following is a vector quantity or a scalar quantity: (a) speed, (b) displacement.

(Total for Question 3 is 1 mark)

4 In the equation $s = ut + 1/2\ a\ t^2$, s is measured in metres, u in m/s, t in seconds and a in m/s^2. Show that the term $1/2\ a\ t^2$ has units of metres.

(Total for Question 4 is 2 marks)

5 A particle moves in a straight line with constant acceleration. It passes point A with speed 4 m/s. Nine seconds later it passes point B with speed 22 m/s. Find the distance AB.

(Total for Question 5 is 3 marks)

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Mark scheme · 3.1 Mechanics: Quantities, Units and Kinematics: 10-minute Pack

Question 1

5600 cao **B1**

Answer: 5600 m

Question 2

90 cao **B1**

Answer: 90 m

Question 3

speed correctly identified as a scalar and displacement correctly identified as a vector, both required **B1**

Answer: Speed is a scalar quantity; displacement is a vector quantity.

Question 4

units of a t^2 = (m s^{-2})(s^2) = m, with the s^2 terms shown cancelling **B1**

conclusion that 1/2 a t^2 therefore has units of metres, consistent with s cso **B1**

Answer: 1/2 a t^2 has units of metres, consistent with s.

Question 5

a = (22-4)/9 **M1**

s = 1/2(u+v)t = 1/2(4+22)(9), or ft using s = ut + 1/2 a t^2 **M1**

117 m cao **A1**

Answer: 117 m

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