

Newton's Third Law

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.5 Forces
Sub-Topic	Newton's Third Law
Difficulty Level	Silver Level
Booklet	Mark Scheme

Time Allowed: 21 minutes

Score: /20

Percentage: /100

Grade Boundaries:

M1.(a) acceleration = change in velocity / time taken

allow $a = \Delta v / t$

1

(b) $= \frac{(5 - 3)}{6}$

1

$-0.33 \text{ (m / s}^2\text{)}$

1

allow 0.33 m / s^2 with no working shown for 2 marks

(c) force = mass × acceleration

allow $F = m a$

1

(d) 70×0.33

allow ecf from 4.3

1

23.1 (N)

allow 23.1 with no working shown for 2 marks

1

(e) before throwing the bag the momentum of the skater and bag is zero

1

when it is thrown the bag has momentum forwards

1

because momentum before = momentum after

1

the skater has equal backwards momentum so will move backwards

1

[10]

- M2.** (a) **A** constant speed / velocity
accept steady pace
*do **not** accept terminal velocity*
*do **not** accept stationary*

1

- B** acceleration
accept speeding up

1

- C** deceleration
accept slowing down
accept accelerating backwards
accept accelerating in reverse
*do **not** accept decelerating backwards*

1

- (b) (i) the distance the car travels under the braking force
accept braking distance

1

- (ii) speed/velocity/momentum

1

- (c) (i) 5000 (N) to the left
***both** required*
accept 5000(N) with the direction indicated by an arrow drawn pointing to the left

accept 5000(N) in the opposite direction to the force of the car (on the barrier)

accept 5000(N) towards the car

1

(ii) to measure/detect forces exerted (on dummy / driver during the collision)

1

(iii) 4

allow 1 mark for showing a triangle drawn on the straight part of the graph

or correct use of two pairs of coordinates

2

m/s²

*do **not** accept mps²*

1

[10]