

Acceleration

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.5 Forces
Sub-Topic	Acceleration
Difficulty Level	Bronze Level
Booklet	Mark Scheme

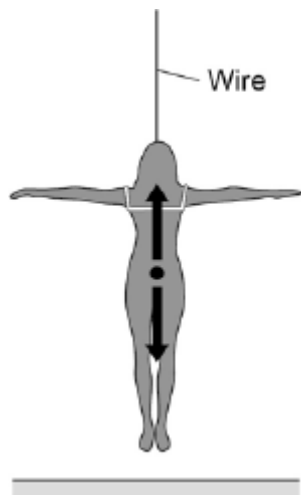
Time Allowed: 40 minutes

Score: /39

Percentage: /100

Grade Boundaries:

M1.(a)



arrow pointing vertically upwards

1

arrow pointing vertically downwards

1

(b) Gravitational force

*if more than **two** boxes ticked apply list principle*

1

Tension force

1

(c) 0 (N)

1

(d) weight = 70×9.8 (= 686)

1

weight = 690 (N)

1

allow 690 (N) with no working shown for 2 marks

allow 686 (N) with no working shown for 1 mark

(e) 34 (N) / 30 (N)

allow ecf from 05.4 correctly calculated

1

(f) resultant force = mass \times acceleration

accept $F = ma$

1

accept equation correctly rearranged for a

(g) $25 = 65 \times a$

1

$$a = 25 / 65$$

1

$$a = 0.38(4615...) \text{ (m / s}^2\text{)}$$

1

allow 0.38 (m / s²) with no working for 3 marks

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M2.(a) terminal

1

(b) 5.4 (kg)

correct substitution of $54 = m \times 10$ gains 1 mark

2

(c) (i) $0 < a < 10$

1

some upward force
accept some drag / air resistance

1

reduced resultant force

1

(ii) 0

1

upward force = weight (gravity)

1

resultant force zero

1

[9]

M3. (a) (i) 12

1

(ii) 0.2

allow 1 mark for their (a)(i) $\div 60$ and correctly calculated

1

m/s²

accept correct unit circled in list

accept ms⁻²

do **not** accept mps²

1

(b) B

1

[4]

M4. (a) distance travelled under the braking force
accept braking (distance)

1

(b) (directly) proportional
accept a correct description using figures

or

increase in the same ratio

eg if speed doubles then

thinking distance doubles

accept for 1 mark positive correlation

accept for 1 mark as speed

increases so does thinking distance

accept as one increases the other increases

accept as thinking distance increases speed increases

2

(c) (i) control variable

1

(ii) experiment done, student listens to music / ipod (etc)

1

experiment (repeated), student not listening to music

for both marks to be awarded there must be a comparison

1

(d) increase it

accept an answer which implies reactions are slower

do **not** accept answers in terms of thinking distance only

1

(e) Y

1

[8]

M5. (a) MN

accept 5.8, 8 seconds must include unit

1

(b) LM

accept 0.8, 5.8 seconds must include unit

1

(c) (i) 0.8

1

(ii) drinking alcohol

1

(d) straight (by eye) line starting at 0.8 seconds

1

line drawn steeper than LM starting before L

ignore lines going beyond 2 seconds but line must exceed
2.5 metres per second before terminating

1

[6]