

Resultant Forces

Mark Scheme 1

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

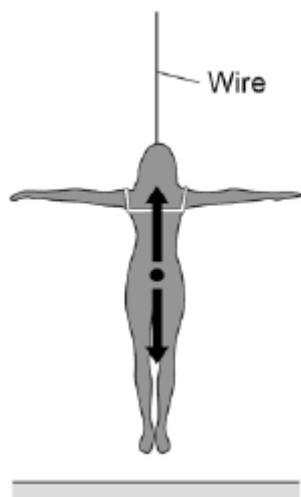
Time Allowed: 53 minutes

Score: /52

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 × 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

[12]

M2.(a) 4 N to the right

1

(b) (i) bigger than

1

equal to

1

(ii) reduces it

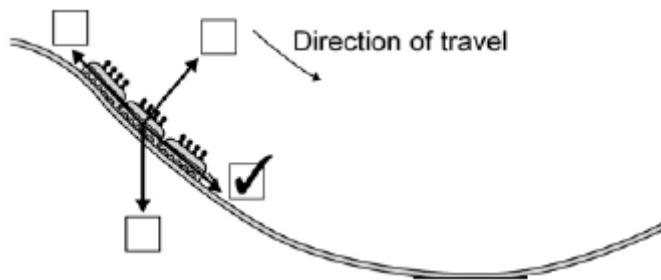
1

increases air resistance / drag / force C
accept parachute has large(r) (surface) area

1

[5]

M3.(a) correct box ticked



1

(b) (i) 30

ignore added units

1

(ii) 2250 or their (b)(i) \times 75 correctly calculated

allow 1 mark for correct substitution ie 75×30 or their (b)(i) \times 75 provided no subsequent step shown

an answer of 750 gains 1 mark only if answer to (b)(i) is 10

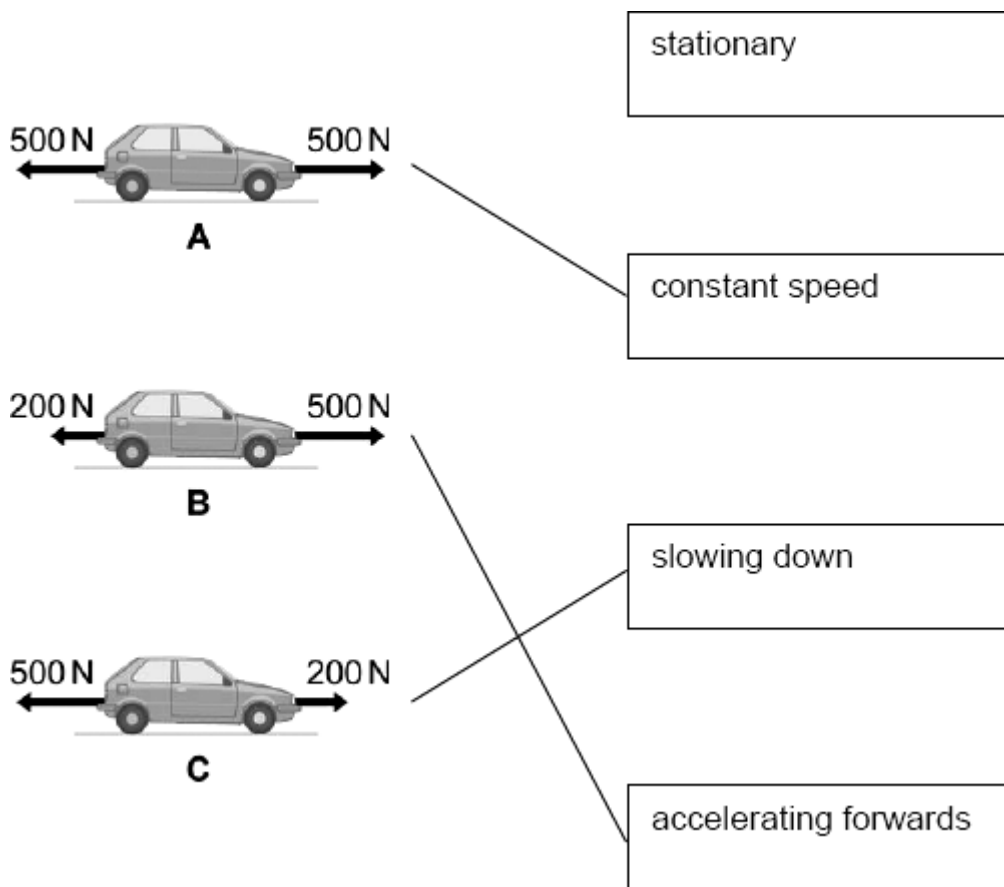
2

[4]

M4.(a) 3 lines drawn
all correct

allow 1 mark for each correct line

if two or more lines are drawn from any diagram then all these lines are incorrect



3

- (b) (i) horizontal arrow to the right

judge by eye

accept an arrow drawn outside the box if it is labelled correctly

1

- (ii) horizontal arrow to the left

judge by eye

accept an arrow drawn outside the box if it is labelled correctly

1

- (iii) equal to

1

- (iv) to measure the forces exerted on the dummy during the impact

1

[7]

M5. (a) (i) 50 (N)

ignore any units

1

- (ii) resultant force

1

- (iii) 4000

accept their (a)(i) $\times 80$ correctly calculated for 2 marks

allow 1 mark for correct substitution i.e. 50×80 or their (a)(i) $\times 80$

ignore any units

2

- (b) (i) joule

1

- (ii) heat

1

[6]

M6. (a) (i) 0.6

allow 1 mark for correct substitution

2

newtons

accept N

*do **not** accept n*

accept Newtons

1

(ii) the same as

1

(b) (i) changed velocity

accept increased/ decreased for change

accept speed for velocity

accept change direction

accept getting faster/ slower

accept start/ stop moving

*accept correct equation in terms of change in speed or
change in velocity*

1

(ii) down(wards)

accept towards the ground

accept ↓

*do **not** accept south*

1

[6]

M7. (a) (i) friction

accept any way of indicating the correct answer

1

(ii) gravity

accept any way of indicating the correct answer

1

(b) (i) accelerates **or** speed / velocity increases

accept faster and faster (1 mark)

*do **not** accept faster pace / falls faster*

or suggestions of a greater but constant speed

1

downwards / falls

accept towards the Earth / ground

*this may score in part (b)(ii) if it does not score here and
there is no contradiction between the two parts*

1

- (ii) constant speed / velocity **or** terminal velocity / speed or zero acceleration
stays in the same place negates credit

1

[5]

M8. (a) B

more aerodynamic **or** most streamlined shape **or**
smaller (surface) area

*accept less air/wind resistance **or** less drag **or** less friction
clothing traps less air **or** rolled up into ball **or** arms, legs
drawn in*

accept converse

2

- (b) (i) gravity

1

- (ii) air resistance

1

- (iii) go up

1

- (iv) stays the same

1

- (c) bigger the area, the bigger force Y

accept the converse

or bigger the area more drag

accept when the parachute opens then force Y bigger

or bigger the area more air resistance
need the relation of area to force

1

[7]