



Interactive Example Candidate Responses

Paper 6 (May / June 2016), Question 2

Cambridge IGCSE™
Physics 0625



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- 2 A student is using a balancing method to determine the weight of a piece of soft modelling clay. The apparatus is shown in Fig. 2.1.

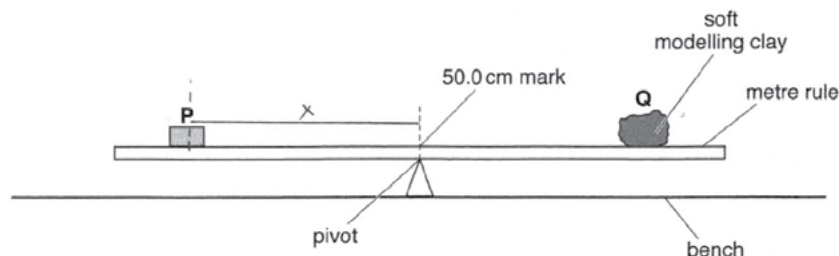


Fig. 2.1

P is a metal cube of weight $P = 1.0\text{ N}$. Q is the piece of soft modelling clay.

The student places the cube P so that its weight acts at a distance x from the pivot.

He adjusts the position of Q to balance the rule and measures the distance y from the centre of Q to the pivot. He calculates the weight W of Q using the equation $W = \frac{Px}{y}$.

- (a) On Fig. 2.1, mark clearly the distance x . [1]

- (b) Suggest a change to Q that would make it easier to find the value of y accurately.

+ Make the shape of the object more defined, e.g.: square. So you can find the center of the object. [1]

- (c) It is difficult to achieve an exact balance of the metre rule in this type of experiment. This can make the result unreliable.

Explain how you would reduce the effect of this problem to improve the reliability of the experiment.

+ Use a solid object instead of a modelling clay.
+ Make sure object P and Q don't cover the lines and numbers of the ruler. [1]

Select
page

Your
Mark

2(a)

2(b)

2(c)

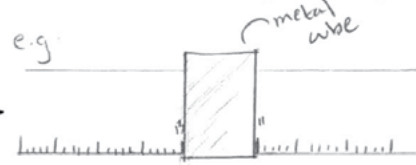
2(d)

2(e)

Q2	Mark scheme
(a)	x shown clearly from centre of P to pivot
(b)	Make Q into a cube/regular shape/small contact area with rule
(c)	Move Q or P slowly one way until it just tips, then back other way until it tips back and take middle reading OR repeat procedure/experiment AND take average
(d)	Measure width w of cube Place $w/2$ either side of desired position OR draw centre line on cube/find centre of mass of cube and mark side of rule in desired position OR take readings on both sides of the cube and find the mean
(e)	Place rule on pivot (without P and Q) and record/find balance point

- (d) The metal cube **P** is larger than the width of the metre rule.

Explain briefly how you would determine the reading of the metre rule scale at the position of the centre of mass of **P**. You may draw a diagram.



e.g. step 1) you will determine the two points. Beginning of the cube and the back.
step 2) And because we need the center where we are going to add both values (e.g. 11 + 3) and then divide by 2.
(e.g. $24 \div 2 = 12$)

Step) hence you will find the center of the cube in the most accurate way possible.

[2]

- (e) Before starting the experiment, the student determines the position of the centre of mass of the metre rule.

Explain briefly how you would do this.

+ By balancing the ruler on the Pivot.

+ Or by hanging it from two sides and then drawing a line where the plumb falls. where the two lines intersect is the centre of mass, [1]

[Total: 6]

after each side

Your
Mark

2(a)

2(b)

2(c)

2(d)

2(e)

Q2	Mark scheme
(a)	x shown clearly from centre of P to pivot
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(d)	Measure width w of cube Place w/2 either side of desired position OR draw centre line on cube/find centre of mass of cube and mark side of rule in desired position OR take readings on both sides of the cube and find the mean
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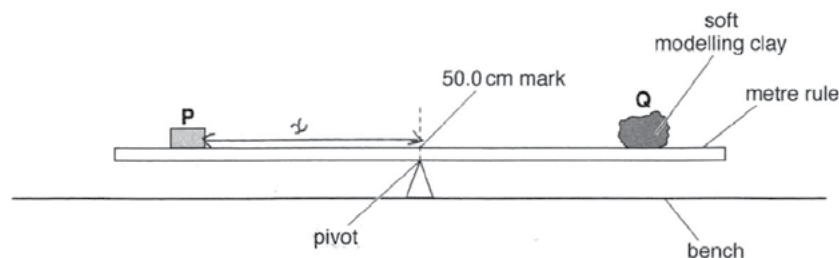


Fig. 2.1

P is a metal cube of weight $P = 1.0\text{ N}$. Q is the piece of soft modelling clay.

The student places the cube P so that its weight acts at a distance x from the pivot.

He adjusts the position of Q to balance the rule and measures the distance y from the centre of Q to the pivot. He calculates the weight W of Q using the equation $W = \frac{Px}{y}$.

- (a) On Fig. 2.1, mark clearly the distance x . [1]

- (b) Suggest a change to Q that would make it easier to find the value of y accurately.

Give an appropriate measured shape to the modelling clay. [1]

- (c) It is difficult to achieve an exact balance of the metre rule in this type of experiment. This can make the result unreliable.

Explain how you would reduce the effect of this problem to improve the reliability of the experiment.

Repeating By repeating the experiment several times and taking average. [1]

Select page

Your Mark

2(a)

2(b)

2(c)

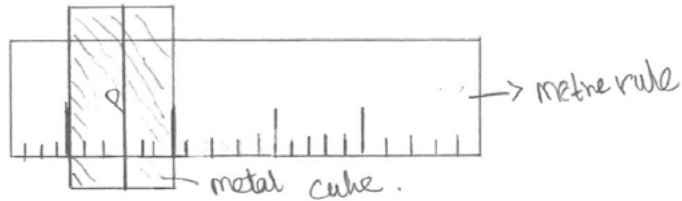
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(e)	Place rule on pivot (without P and Q) and record/find balance point

- (d) The metal cube **P** is larger than the width of the metre rule.

Explain briefly how you would determine the reading of the metre rule scale at the position of the centre of mass of **P**. You may draw a diagram.



By dividing the mass equally on both sides
of the required position.

[2]

- (e) Before starting the experiment, the student determines the position of the centre of mass of the metre rule.

Explain briefly how you would do this.

By placing the metre rule on ^{the} pivot and
~~then~~ seeing the point where it balances equally.

[Total: 6]

Your
Mark

2(a)

2(b)

2(c)

2(d)

2(e)

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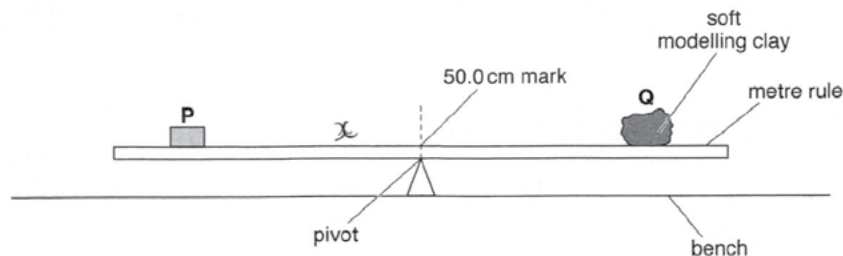


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He adjusts the position of Q to balance the rule and measures the distance y from the centre of Q to the pivot. He calculates the weight W of Q using the equation $W = \frac{Px}{y}$.

- (a) On Fig. 2.1, mark clearly the distance x . [1]

- (b) Suggest a change to Q that would make it easier to find the value of y accurately.

Weight not. Place it on its
centre of mass. [1]

- (c) It is difficult to achieve an exact balance of the metre rule in this type of experiment. This can make the result unreliable.

Explain how you would reduce the effect of this problem to improve the reliability of the experiment.

Repeat the experiment and find
the average. [1]

Select
page

Your
Mark

2(a)

2(b)

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2(d)

2(e)

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(e)	Place rule on pivot (without P and Q) and record/find balance point

- (d) The metal cube P is larger than the width of the metre rule.

Explain briefly how you would determine the reading of the metre rule scale at the position of the centre of mass of P. You may draw a diagram.

you would measure the reading
and subtract it from 50.0cm

[2]

- (e) Before starting the experiment, the student determines the position of the centre of mass of the metre rule.

Explain briefly how you would do this.

by placing on the pivot so it
doesn't tilt

[1]

[Total: 6]

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Mark

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2(b)

2(c)

2(d)

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