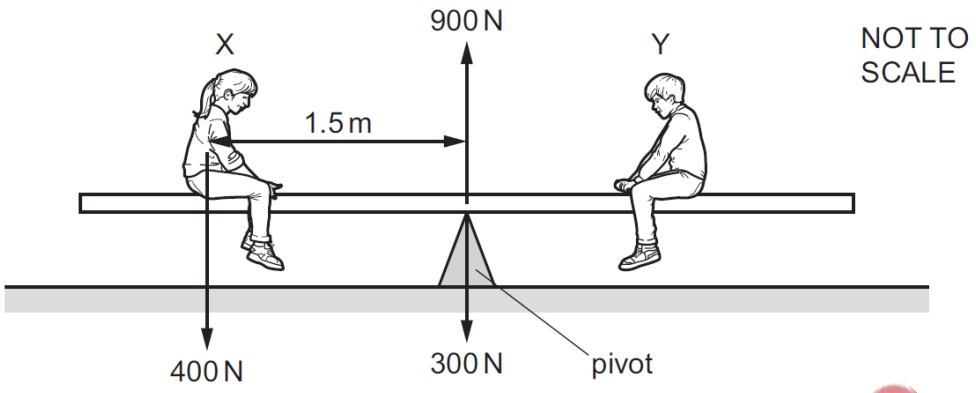
Turning Effect of Force – 2021 IGCSE 0625

1. March/2021/Paper_12/No.9

Two people X and Y sit on a see-saw, as shown.



X weighs 400 N and sits 1.5 m from the pivot.

The weight of the see-saw is 300 N and acts through the pivot.

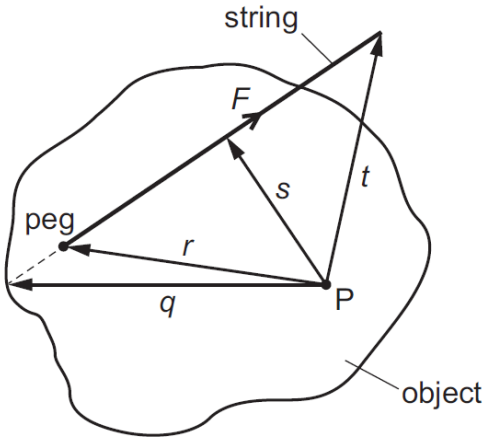
When the see-saw is balanced, the pivot pushes up on the see-saw with a force of 900 N.

What is the weight of person Y and how far from the pivot is he sitting?

	weight of Y / N	distance from pivot / m
A	200	1.5
B	200	3.0
C	400	1.5
D	400	3.0

2. March/2021/Paper_22/No.8

An object is pivoted at point P. A student ties a length of string to a peg on the object. He pulls the string with a force *F*.



What is the moment of the force *F* about the point P?

A $F \times q$ **B** $F \times r$ **C** $F \times s$ **D** $F \times t$

3. June/2021/Paper_31/No.3

A plank balances horizontally on a log of wood, which acts as a pivot.

(a) A girl sits on one end of the plank, and her brother pushes down on the other end to make the plank balance horizontally. Fig. 3.1 shows the arrangement.

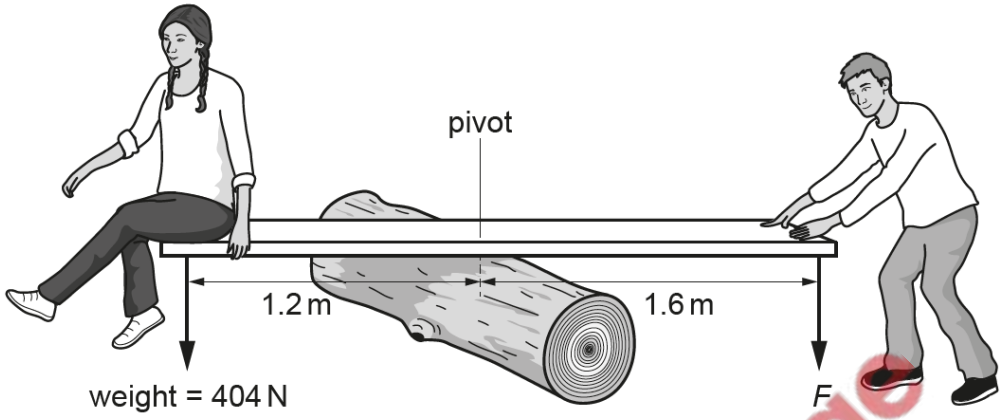


Fig. 3.1 (not to scale)

Calculate the moment of the girl's weight about the pivot and show that it is close to 480 N m.

[3]

(b) The plank balances horizontally when the boy pushes down with a force *F* at a distance of 1.6 m from the pivot.

Calculate the size of force *F*.

force *F* = ... N [3]

[Total: 6]

4. June/2021/Paper_32/No.3

Fig. 3.1 shows a barrier used at a car park. The beam can be raised and lowered by a man rotating it about its pivot.

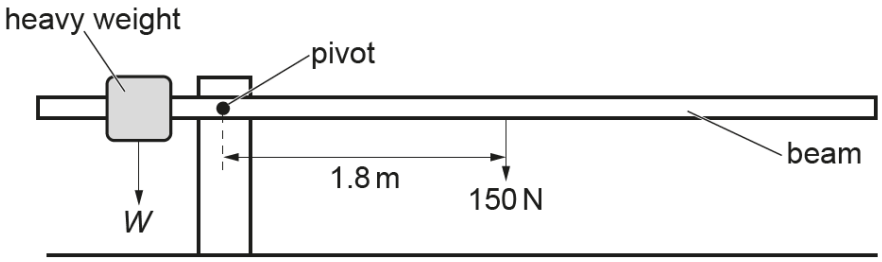


Fig. 3.1 (not to scale)

(a) The weight of the beam is 150 N. This acts at a distance of 1.8 m from the pivot as shown in Fig. 3.1.

Calculate the moment of the weight of the beam about the pivot.

Include the correct unit in your answer.

moment of weight of beam = ... unit ..... [4]

(b) When the weight *W* of the heavy weight acts at a distance of 0.6 m from the pivot, the barrier is horizontal and balanced as shown in Fig. 3.1.
The man raises the barrier and the heavy weight slips to a distance of 0.8 m from the pivot.
This causes a problem for the man trying to lower the barrier.

Describe and explain the problem this causes for the man lowering the barrier.

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.....

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..... [3]

[Total: 7]

5. June/2021/Paper_33/No.3

(a) A girl and her brother sit on opposite sides of a see-saw as shown in Fig. 3.1.

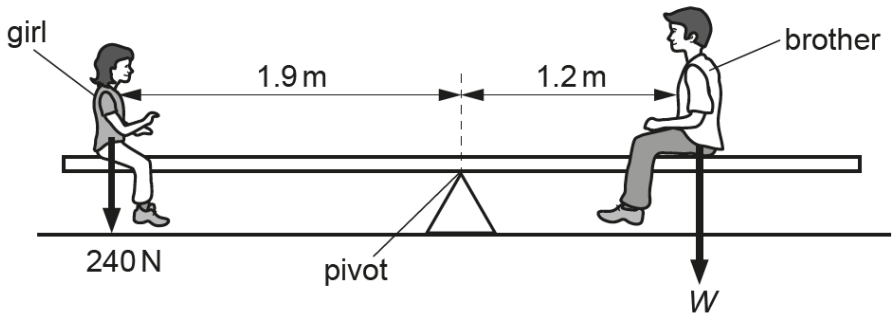

Fig. 3.1

(i) Calculate the girl's moment about the pivot and show that it is close to 460 N m.

[3]

(ii) The see-saw is balanced horizontally.

Calculate the weight *W* of the brother.

W = ... N [3]

(b) The weight of the girl in Fig. 3.1 is 240 N.

Calculate the mass of the girl. Include the unit in your answer.

mass of girl = ... unit ..... [4]

[Total: 10]

6. June/2021/Paper_42/No.2

(a) Define the *moment* of a force.

..... [1]

(b) Fig. 2.1 shows an object of negligible weight. The object is in equilibrium.

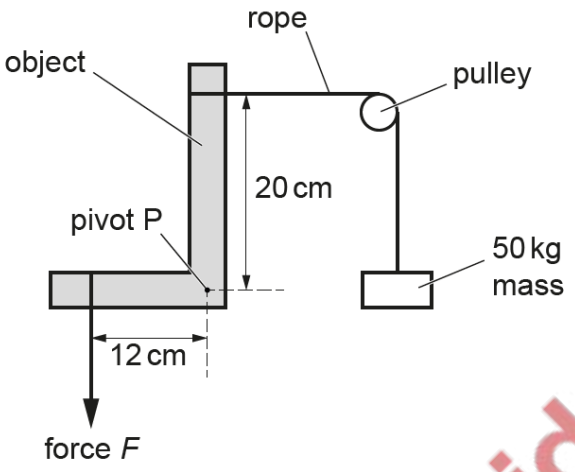

Fig. 2.1

The object is free to rotate about its pivot P.

Calculate the value of force *F*.

F = ... [2]

(c) Describe an experiment involving vertical forces to show that there is no net moment on an object in equilibrium. You may draw a diagram in the space provided.

.....

.....

.....

.....

.....

..... [3]

[Total: 6]

7. March/2021/Paper_32/No.3

Fig. 3.1 shows the forces acting on a uniform balanced beam. The beam is pivoted at its centre.

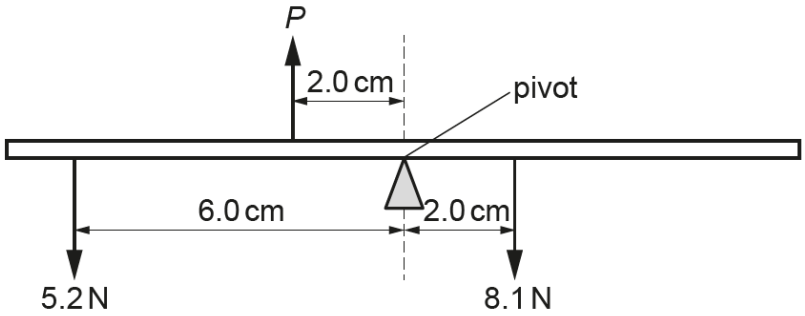

Fig. 3.1

(a) Calculate the moment of the 5.2 N force about the pivot and show that its value is close to 30 Ncm.

[3]

(b) The beam is balanced. Calculate force *P*.

force *P* = ... N [4]

[Total: 7]

8. March/2021/Paper_42/No.2

(a) **(i)** State what is meant by the *moment* of a force about a point.

..... [1]

(ii) Fig. 2.1 shows a large crane on a construction site lifting a block of mass 14 000 kg.

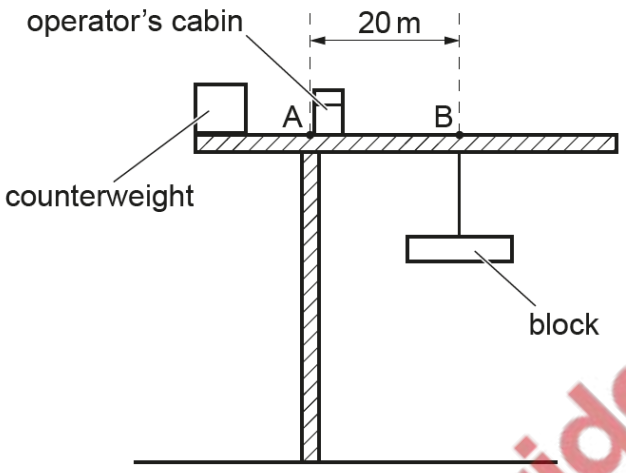

Fig. 2.1

Calculate the moment about A due to the 14 000 kg block suspended from B.

moment = ... [2]

(b) **(i)** Speed is a scalar quantity and velocity is a vector quantity. State the difference between a scalar quantity and a vector quantity.

.....

..... [2]

(ii) Write down **one** other scalar quantity and **one** other vector quantity.

scalar quantity .....

vector quantity .....

[2]

(c) Fig. 2.2 shows two forces acting on an object.

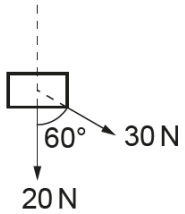

Fig. 2.2 (not to scale)

Draw a scale diagram to determine the resultant force acting on the object. State the scale you use.

scale .....

magnitude of resultant force = ...

direction of resultant relative to the direction of the 20 N force = ...
[4]

[Total: 11]