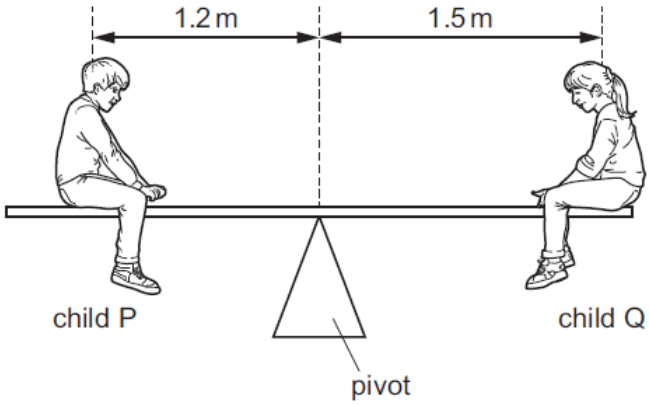
Turning Effect of Force – 2020 IGCSE 0625

1. Nov/2020/Paper_11/No.7

A uniform plank rests on a pivot at its centre.

Two children P and Q sit on the plank in the positions shown.



The mass of child P is 25 kg.

The plank is balanced.

What is the mass of child Q?

A 20 kg **B** 25 kg **C** 31 kg **D** 45 kg

2. Nov/2020/Paper_11/No.8

An object is in equilibrium on the Earth.

Which statement is correct?

A All the forces acting on the object are in the same direction.

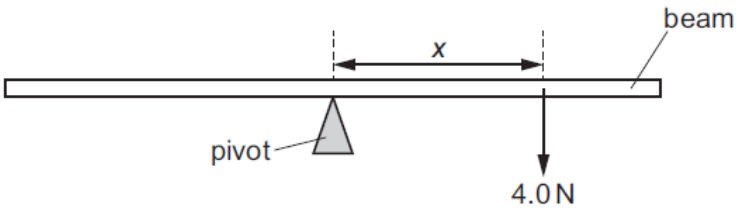
B All the forces acting on the object have the same value.

C The object is weightless.

D The resultant force acting on the object is zero.

3. Nov/2020/Paper_12/No.7

A force of 4.0 N acts on a beam as shown.



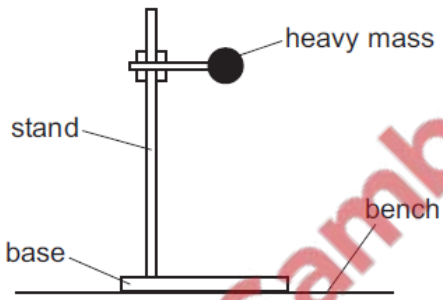
The line of action of the force is a distance *x* from a pivot. The moment of this force about this pivot is 8.0 N cm.

What is distance *x*?

A 0.50 cm **B** 2.0 cm **C** 12 cm **D** 32 cm

4. Nov/2020/Paper_12/No.8

The diagram shows a stand. The stand holds a heavy mass above the bench.



Which two changes would definitely make the stand more stable?

A Lower the mass and make the base narrower.

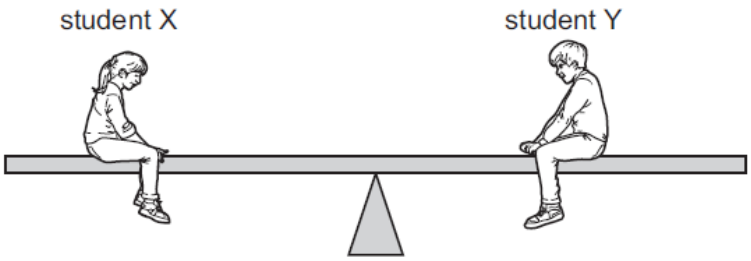
B Lower the mass and make the base wider.

C Raise the mass and make the base narrower.

D Raise the mass and make the base wider.

5. Nov/2020/Paper_13/No.8

Students X and Y are sitting on a seesaw. Student X has a weight of 400 N and student Y has a weight of 600 N. The seesaw is in equilibrium.



Which statement correctly describes why the seesaw is in equilibrium?

A The resultant force is zero and the resultant moment is zero.

B The resultant force is 200 N and the resultant moment is zero.

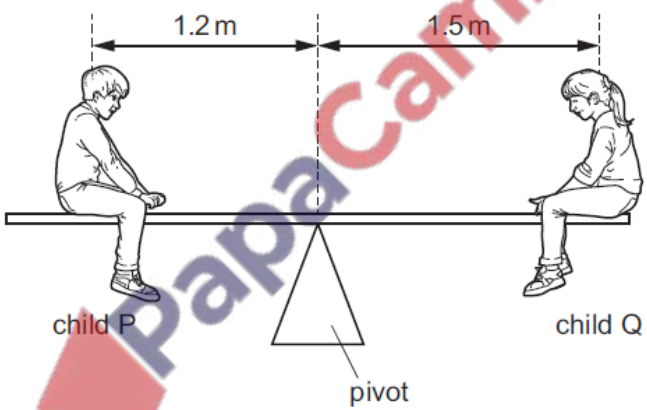
C The sum of the downward forces is zero and the resultant moment is zero.

D The total downward force is 1000 N and the resultant moment is 200 Nm.

6. Nov/2020/Paper_21/No.7

A uniform plank rests on a pivot at its centre.

Two children P and Q sit on the plank in the positions shown.



The mass of child P is 25 kg.

The plank is balanced.

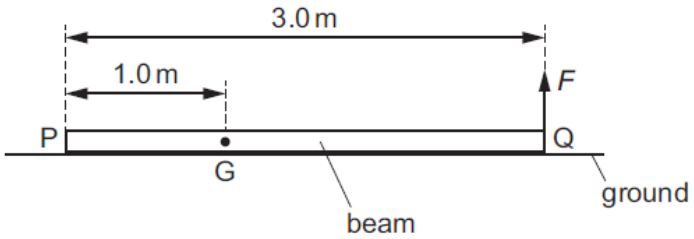
What is the mass of child Q?

A 20 kg **B** 25 kg **C** 31 kg **D** 45 kg

7. Nov/2020/Paper_22/No.7

The diagram shows a beam lying on the ground. End Q is lifted from the ground by the force *F*.

End P of the beam remains on the ground.



The length of the beam is 3.0 m and its weight is 600 N.

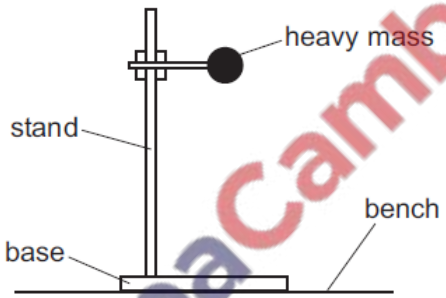
The centre of mass of the beam at G is 1.0 m from end P.

What is the size of the force *F* when it just raises end Q from the ground?

A 200 N **B** 300 N **C** 400 N **D** 600 N

8. Nov/2020/Paper_22/No.8

The diagram shows a stand. The stand holds a heavy mass above the bench.



Which two changes would definitely make the stand more stable?

A Lower the mass and make the base narrower.

B Lower the mass and make the base wider.

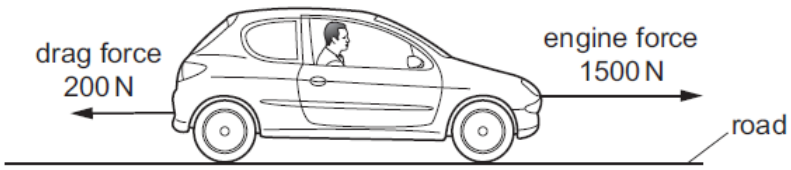
C Raise the mass and make the base narrower.

D Raise the mass and make the base wider.

9. Nov/2020/Paper_23/No.7

The diagram shows a car moving along a road.

The force due to the engine is 1500 N and the total drag force is 200 N.



What is the motion of the car?

A constant speed

B decreasing speed

C increasing speed

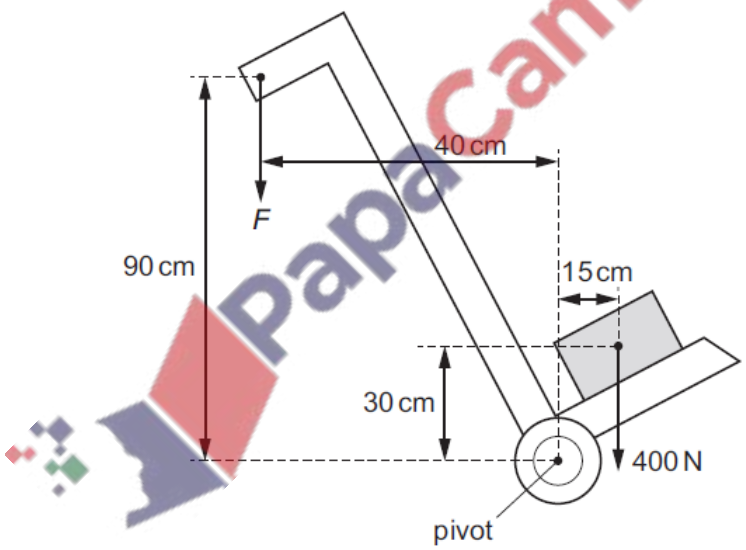
D reversing

10. Nov/2020/Paper_23/No.8

The diagram shows a trolley used to transport a load of 400 N.

A force *F* vertically downwards is needed to balance the trolley as shown.

The centre of mass of the trolley is vertically above the pivot.



What is the value of *F*?

A 133 N **B** 150 N **C** 300 N **D** 400 N

11. Nov/2020/Paper_31/No.3(b)

(b) Fig. 3.2 shows the force applied to the brake pedal by the driver's foot.

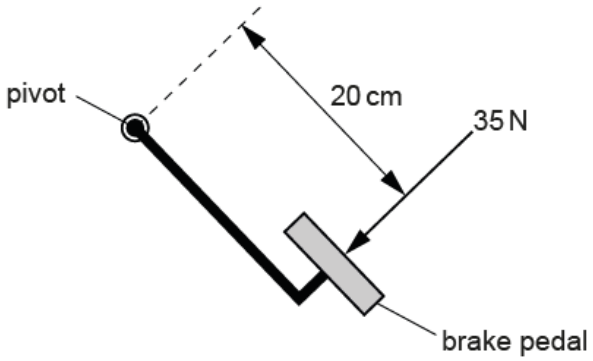


Fig. 3.2

Calculate the moment of the force about the pivot. Include the unit.

moment = ... unit ..... [4]

12. Nov/2020/Paper_32/No.2

A car driver needs to remove one of the wheels on his car. He puts a spanner on a wheel nut.

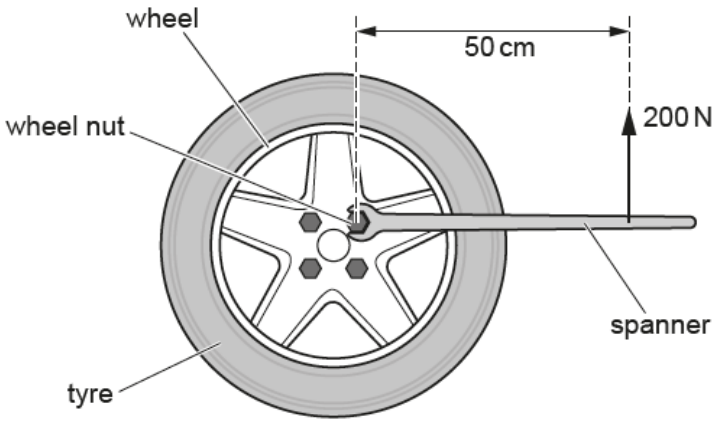


Fig. 2.1

(a) The driver applies a force of 200 N, as shown in Fig. 2.1.

Calculate the moment of the 200 N force about the centre of the wheel nut.

moment of force = ... N cm [3]

(b) The moment in **(a)** does not release the wheel nut. The driver **cannot** increase the force but can increase its moment.

State and explain how the driver can increase the moment of the force.

statement .....

explanation .....

.....

[2]

(c) The driver releases a second wheel nut in a shorter time than the first wheel nut. The driver uses the same amount of energy in releasing both wheel nuts.

less than	the same as	greater than

Complete the sentences using the phrases in the box. Each phrase may be used once, more than once or not at all.

The work done in releasing the second wheel nut is ..... the work done in releasing the first wheel nut.

The power produced in releasing the second wheel nut is ..... the power produced in releasing the first wheel nut.

[2]

[Total: 7]

13. Nov/2020/Paper_33/No.2

(a) Fig. 2.1 shows two children sitting on a see-saw.

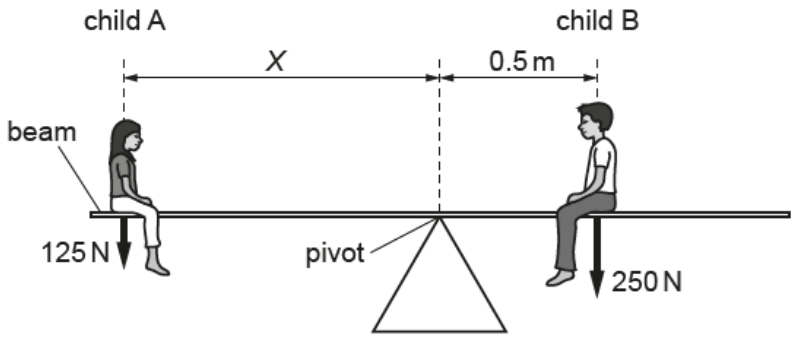


Fig. 2.1 (not to scale)

(i) The weight of child A is 125 N.

Calculate the mass of child A. Include the unit in your answer.

mass of child A = ... unit ..... [3]

(ii) Fig. 2.1 shows child A and child B sitting in positions which balance the see-saw horizontally.

Using the information in Fig. 2.1, determine the distance *X*.

distance *X* = ... m [3]

(b) The person in Fig. 2.2 is pushing a child on a swing.

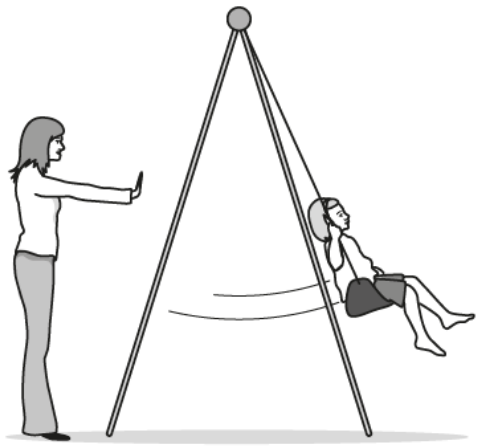


Fig. 2.2

State the name of the force that acts against the motion of the swing.

..... [1]

[Total: 7]

14. Nov/2020/Paper_42/No.2

(a) Define the moment of a force about a point.

.....

..... [1]

(b) Fig. 2.1 shows a uniform rod of wood suspended from a pivot.

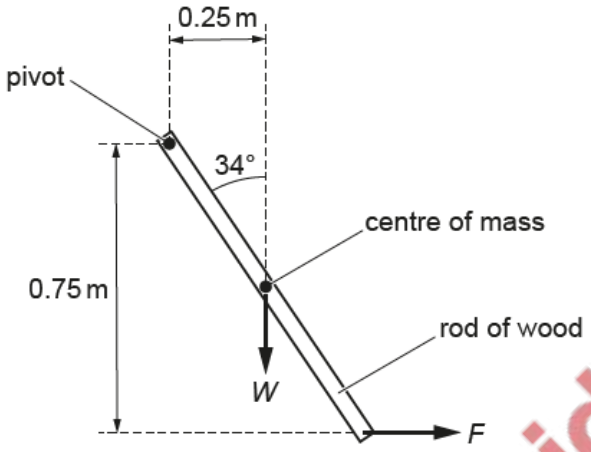


Fig. 2.1 (not to scale)

The rod is held stationary by a horizontal force F acting as shown.
The mass of the rod is 0.080 kg.

Calculate:

(i) the weight W of the rod

weight = ... [1]

(ii) the moment of W about the pivot

moment = ... [2]

(iii) the moment of F about the pivot

moment = ... [1]

(iv) the force F.

force = ... [2]

(c) The angle between the rod and the vertical is increased.

State whether the force *F* needed to hold the rod stationary must be increased, decreased or stay the same.
Explain your answer.

.....

.....

.....

..... [2]

[Total: 9]