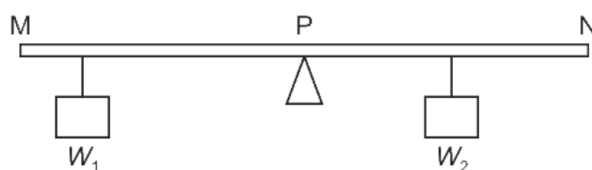


Question 1

The diagram shows a uniform metre rule, MN, pivoted at its midpoint P.



Two weights, W_1 and W_2 , are hung either side of the pivot.

The rule remains balanced.

Which row is correct?

	direction of resultant moment about point M	direction of resultant force on the rule
A	clockwise	downwards
B	clockwise	zero
C	zero	downwards
D	zero	zero

Question 2

Two boys of equal weight sit on one side of a see-saw, as shown. Their father, of weight 1000 N, sits on the other side. The see-saw is balanced and is being used so that it moves up and down.



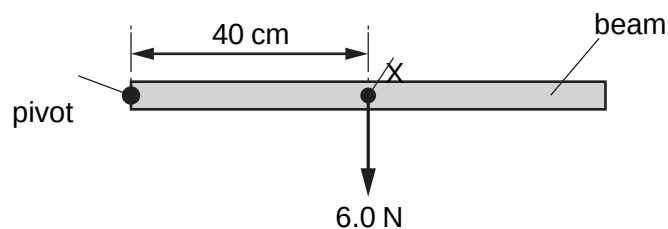
During one part of the cycle, the father descends through a distance of 40 cm. At the same time, the boy nearest the pivot rises through 20 cm, while the other boy rises through 80 cm.

What is the weight of each boy?

- A** 200 N **B** 400 N **C** 600 N **D** 800 N

Question 3

A beam is pivoted at one end, as shown.



The beam weighs 6.0 N and its weight acts at a point X 40 cm from the pivot.

A force of 4.0 N is applied to the beam causing it to balance horizontally.

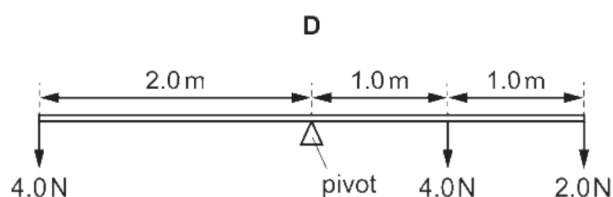
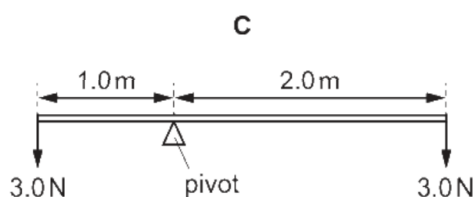
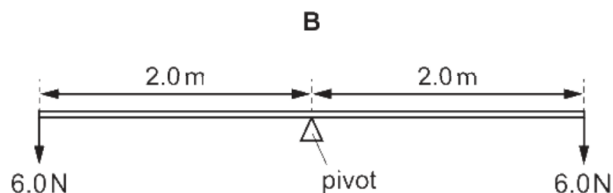
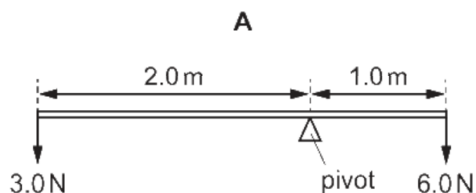
In which direction and where is the 4.0 N force applied?

- A vertically downwards at 20 cm to the left of X
- B vertically downwards at 20 cm to the right of X
- C vertically upwards at 20 cm to the left of X
- D vertically upwards at 20 cm to the right of X

Question 4

The diagrams show four beams, each of negligible weight and freely pivoted.

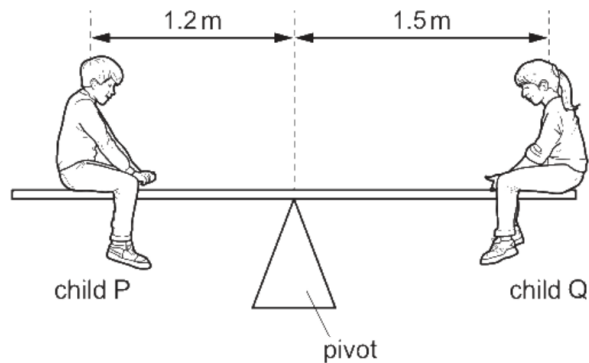
Which beam is **not** in equilibrium?



Question 5

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?

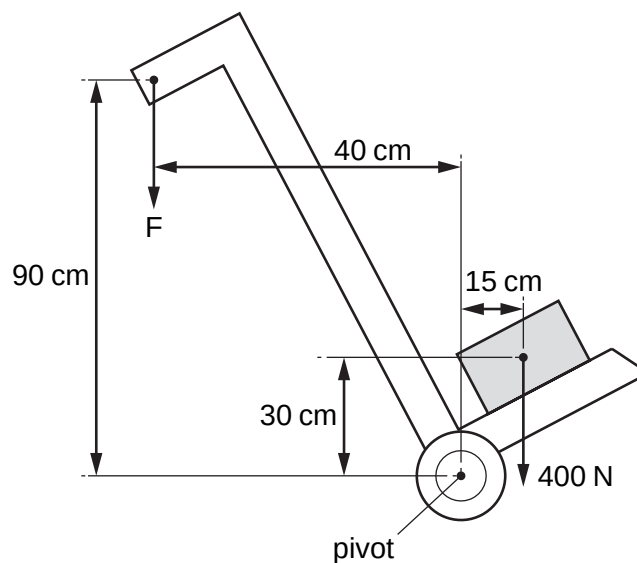
- A** 20 kg **B** 25 kg **C** 31 kg **D** 45 kg

Question 6

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.



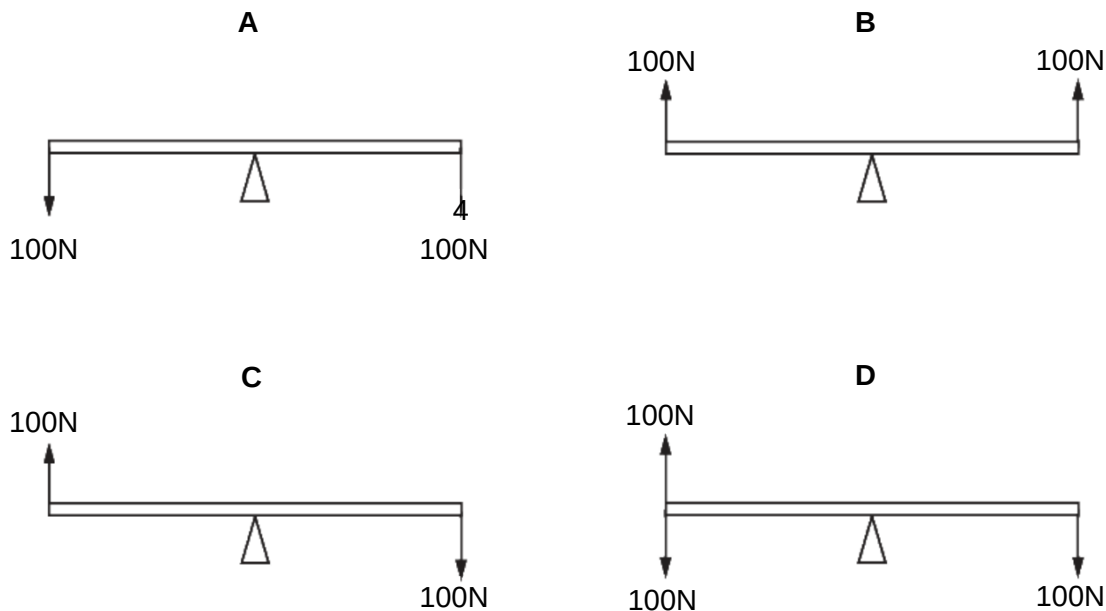
What is the value of F ?

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

Question 7

A uniform rod rests on a pivot at its centre. The rod is not attached to the pivot. Forces are then applied to the rod in four different ways, as shown. The weight of the rod can be ignored.

Which diagram shows the rod in equilibrium?



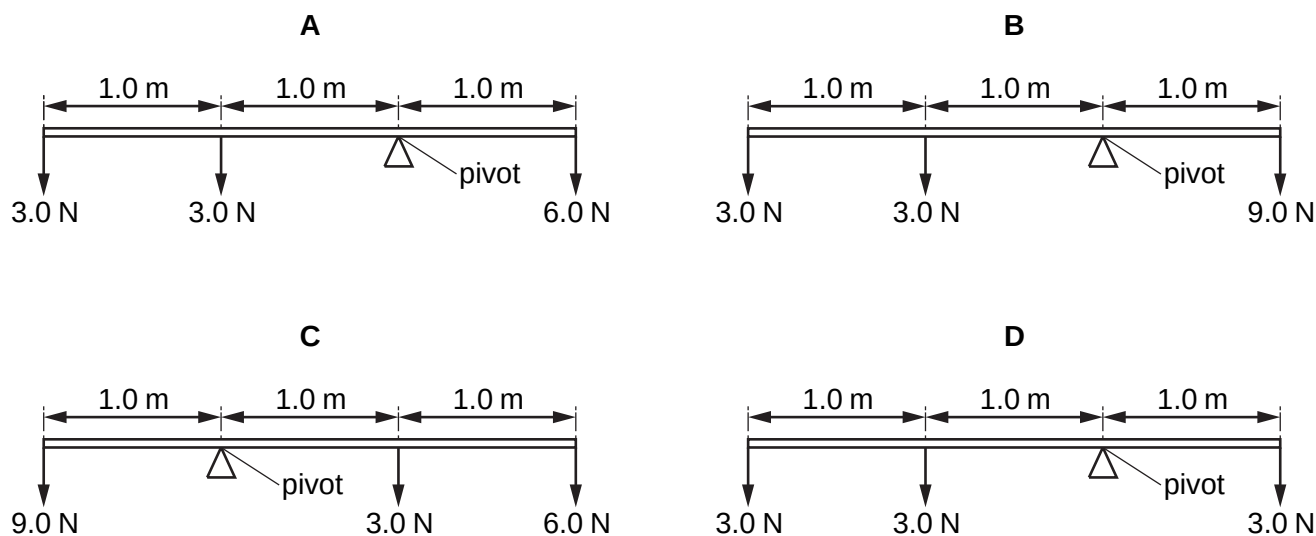
Question 8

Which statement about the moment of a force is not correct?

- A** If an object is balanced about a pivot, the resultant moment on the object must be zero.
- B** The moment of a force is a measure of its turning effect.
- C** The moment of a force about a point is equal to: force $\times$ perpendicular distance from the point.
- D** The moment of a force about a point increases when the perpendicular distance of the force from the point decreases.

Question 9

Which beam is balanced? (Ignore the weight of the beam.)



Question 10

Which statement gives a complete description of any object that is in equilibrium?

- A** There are no forces acting.
- B** There is no resultant force.
- C** There is no resultant force and no resultant turning effect.
- D** There is no resultant turning effect.

Question 11

Three simple machines are shown.

1



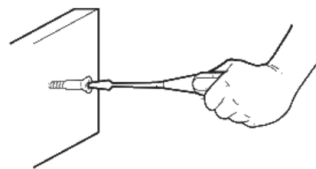
moving soil with
a wheelbarrow

2



cutting string
with scissors

3



screwing a screw
with a screwdriver

Which machines are an application of the moment of a force?

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only