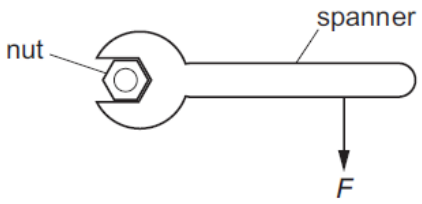
1. March/2020/Paper_12/No.8

A force *F* is applied to a spanner, as shown.



Which action increases the moment of *F* about the centre of the nut?

A apply the force *F* to the end of the spanner handle

B apply the force *F* parallel to the spanner handle

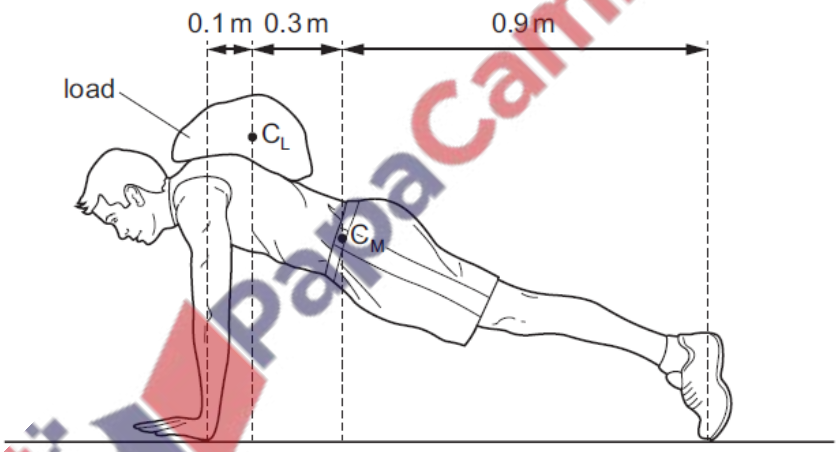
C spray oil on the nut

D use a shorter spanner

2. March/2020/Paper_22/No.9

An athlete with mass 70 kg trains by performing press-ups with a load on his back. The diagram shows the perpendicular distances involved.

The centre of mass of the athlete is C_M and the centre of mass of the load he is carrying is C_L.



The mass of the load is 6.0 kg.

What is the upward force exerted by his two arms?

A 54 N **B** 76 N **C** 540 N **D** 760 N

3. March/2020/Paper_32/No.2

A 50 cm rule is balanced at its mid-point. A force of 8.0 N acts at a distance of 10 cm from one end of the rule.

Fig. 2.1 shows the arrangement.

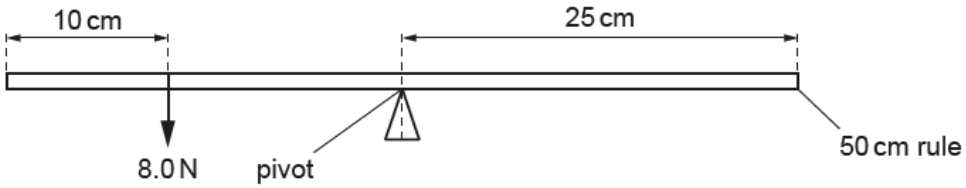


Fig. 2.1

(a) Calculate the moment of the 8.0 N force about the pivot. Give the unit.

moment = ...

unit = ...

[5]

(b) Another force acts at a point 10 cm from the pivot. It makes the rule balance.

On Fig. 2.1, draw an arrow to show the position and direction of this force. [2]

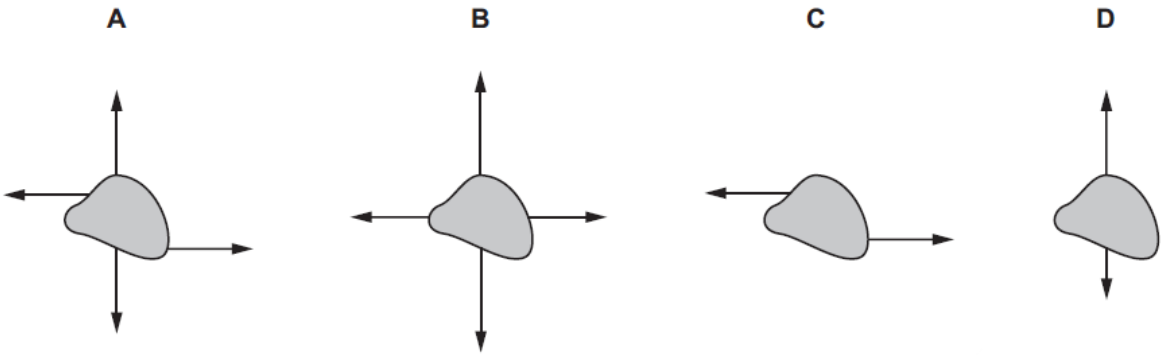
[Total: 7]

4. June/2020/Paper_11/No.8

Forces are applied to four identical objects.

The lengths of the arrows indicate the magnitude of each force.

Which object is in equilibrium?



5. June/2020/Paper_12/No.8

What is meant by the moment of a force on an object?

A the magnitude of the force on the object

B the direction of the force on the object

C the time for which the force acts on the object

D the turning effect of the force on the object

6. June/2020/Paper_13/No.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 × perpendicular distance from the point.

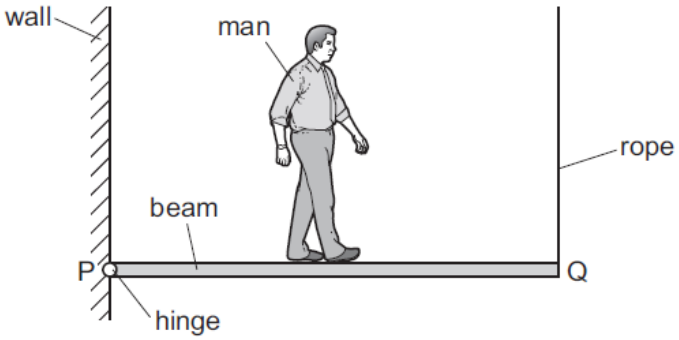
D The moment of a force about a point increases when the perpendicular distance of the force from the point decreases.

7. June/2020/Paper_21/No.7

The diagram shows a wooden beam PQ, of negligible weight, which is attached to a wall by a hinge at P and kept in a horizontal position by a vertical rope attached at Q.

The beam is 3.0 m in length.

A man of weight 800 N walks along the beam from P to Q.



What is the distance of the man from P when the tension in the rope at Q becomes equal to 500 N?

A 0.53 m **B** 1.1 m **C** 1.9 m **D** 2.5 m

8. June/2020/Paper_31/No.5

A metre rule is balanced on a pivot by three vertical forces, as shown in Fig. 5.1.

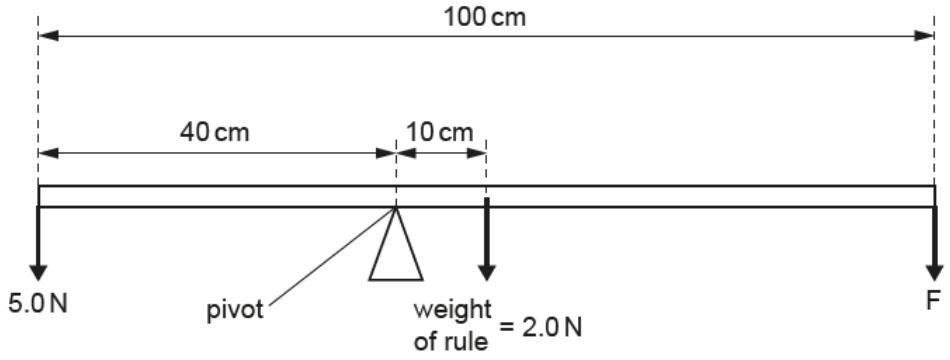


Fig. 5.1 (not to scale)

(a) Show that the moment of the 5.0 N force about the pivot is 200 N cm.

[2]

(b) Calculate the size of force F.

F = ... N [4]

[Total: 6]

9. June/2020/Paper_43/No.3(a),(b)

In a double-decker bus there are two passenger compartments, one above the other.

(a) Fig. 3.1 shows a double-decker bus on a tilted platform.

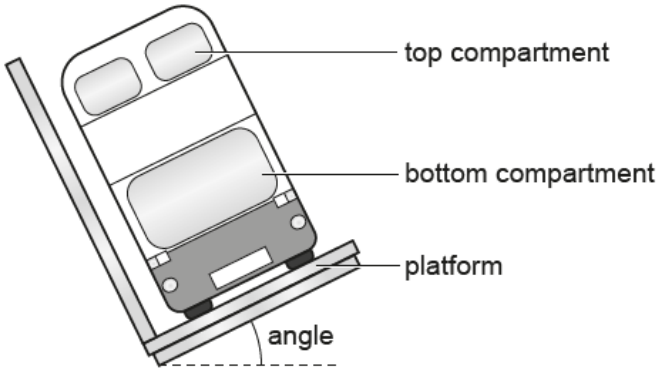


Fig. 3.1

The platform is used to test the stability of the bus.

The angle the bus makes with the horizontal is gradually increased until the bus begins to topple to the left.

Explain why the bus begins to topple.

.....

.....

..... [1]

(b) There are 30 passengers in the upper compartment of the bus and 2 passengers in the bottom compartment of the bus.

State how this affects the stability of the bus and the reason for this.

.....

.....

..... [2]