Turning Effect of Force – 2022 November IGCSE 0625

1. Nov/2022/Paper_11/No.5

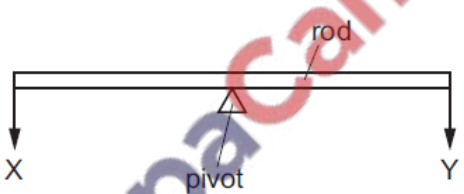
A force *F* acts on an object at a distance *x* from a pivot.

Which two changes both increase the moment of the force about the pivot?

	change 1	change 2
A	decrease *F*	decrease *x*
B	decrease *F*	increase *x*
C	increase *F*	decrease *x*
D	increase *F*	increase *x*

2. Nov/2022/Paper_11/No.7

The diagram shows a uniform rod with its midpoint on a pivot. Two weights X and Y are hung from the rod. The rod is in equilibrium.



Which statement is correct?

A The forces at X and Y have different values.

B There is a resultant turning effect on the rod.

C The resultant force on the rod is zero.

D The rod does not have a centre of mass.

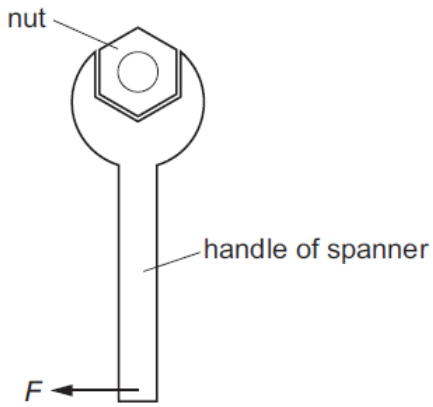
3. Nov/2022/Paper_12/No.5

What is the unit for the moment of a force about a point?

A W **B** Ns **C** N/m **D** Nm

4. Nov/2022/Paper_13/No.5

A spanner is used to tighten a nut on a bicycle wheel. A force *F* is needed.



How can the force *F* be reduced?

A Use a longer handle.

B Use a shorter handle.

C Use a thinner handle.

D Use a thicker handle.

5. Nov/2022/Paper_13/No.7

The diagram shows a bus with an upper floor and a lower floor.

Passengers on the upper floor are not allowed to stand while the bus is moving. Standing passengers make the bus less stable.

Why is this?

A The total weight is greater when they stand.

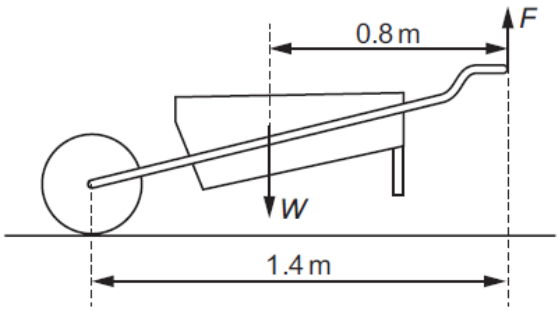
B There is too much pressure on the floor.

C The centre of mass is higher up.

D The density is greater.

6. Nov/2022/Paper_21/No.5

A wheelbarrow has a weight *W* of 140 N.



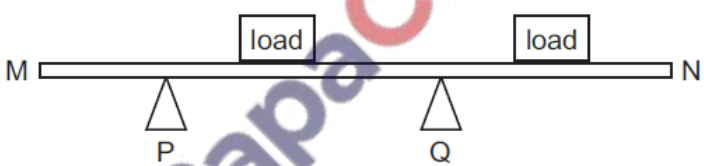
Which vertical force *F* is needed to support the wheelbarrow in the position shown?

A 60 N **B** 80 N **C** 140 N **D** 245 N

7. Nov/2022/Paper_22/No.5

The diagram shows a metre rule MN on two supports, P and Q.

Two loads are placed on the rule, as shown.



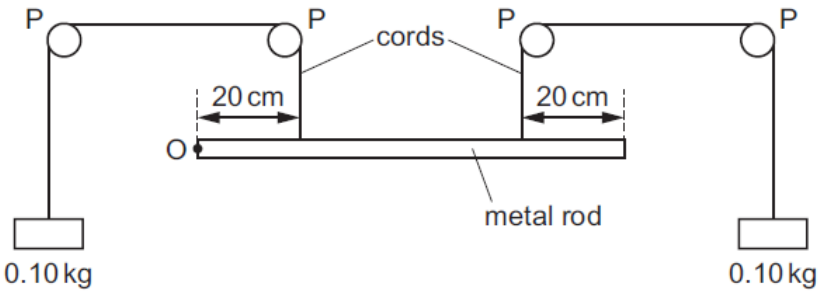
The rule rests steadily on the supports.

Which row is correct?

	total moment about M	total moment about N
A	is clockwise	is anticlockwise
B	is clockwise	is zero
C	is zero	is clockwise
D	is zero	is zero

8. Nov/2022/Paper_23/No.5

A metal rod of length 80 cm is pivoted at point O. Its centre of mass is at its mid-point. Four pulley wheels are indicated by the letter P.



The rod is in equilibrium, as shown.

What is the weight of the rod?

A 0.20 N **B** 1.0 N **C** 2.0 N **D** 4.0 N

9. Nov/2022/Paper_31/No.3

A sailor uses a winch to raise a sail on a boat. Fig. 3.1 shows the sailor turning the winch.

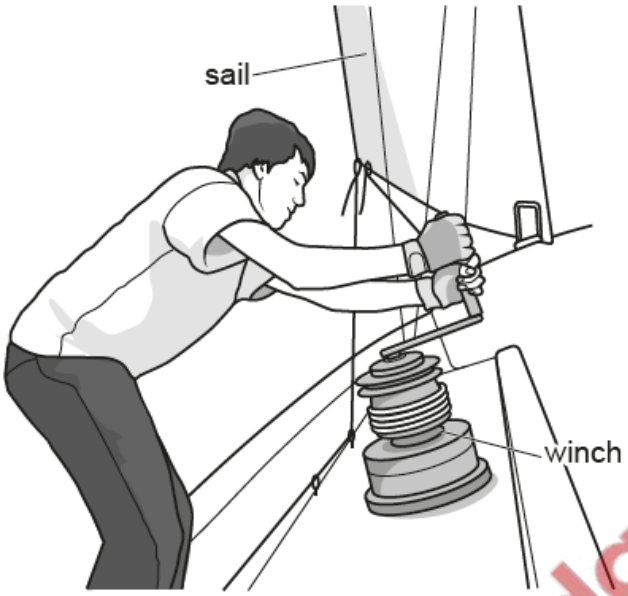


Fig. 3.1

(a) The sailor applies a force of 200 N at a distance of 30 cm from the pivot in the winch, as shown in Fig. 3.2.

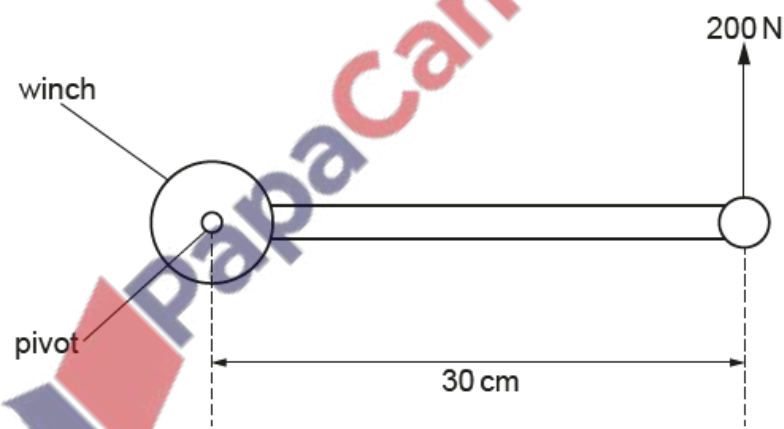


Fig. 3.2

Calculate the moment of this force about the pivot.

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

(b) **(i)** Describe **two** useful energy transfers when the sailor uses the winch to raise the sail.

1 .....

2 .....

[2]

(ii) Describe **one** non-useful energy transfer when the sailor uses the winch to raise the sail.

..... [1]

[Total: 6]

10. Nov/2022/Paper_41/No.3

A rock climber, of total mass 62 kg, holds herself in horizontal equilibrium against a vertical cliff. She pulls on a rope that is fixed at the top of the cliff and presses her feet against the cliff.

Fig. 3.1 shows her position.

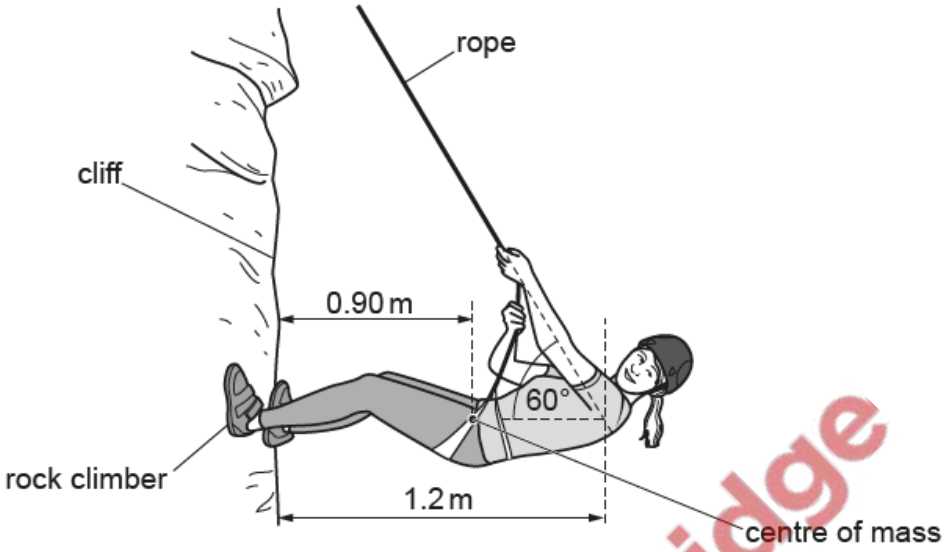


Fig. 3.1 (not to scale)

(a) Calculate the total weight of the climber.

weight = ... [1]

(b) State the **two** conditions needed for equilibrium.

1. .....

2. .....

[2]

(c) The climber's centre of mass is 0.90 m from the cliff.

(i) Calculate the moment about her feet due to her weight.

moment = ... [2]

(ii) The line of the rope meets the horizontal line through her centre of mass at a distance of 1.2 m from the cliff, as shown in Fig. 3.1. The rope is at an angle of 60° to the horizontal.

Determine the tension in the rope.

tension = ... [3]

[Total: 8]