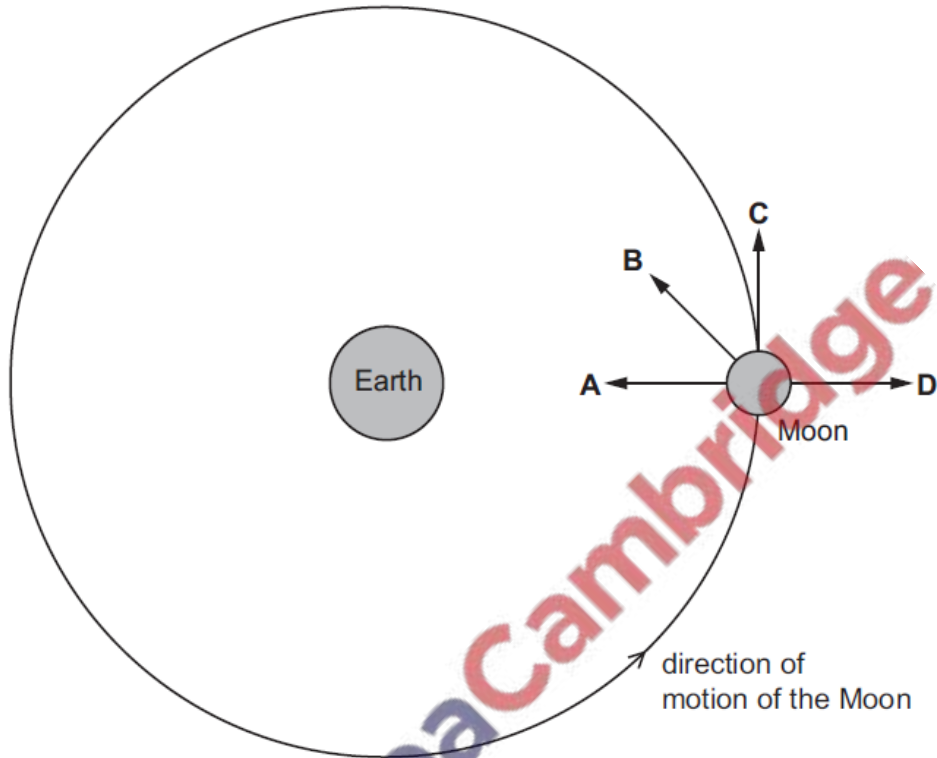


1. June/2022/Paper_11/No.3

The diagram represents the Moon in its orbit around the Earth.

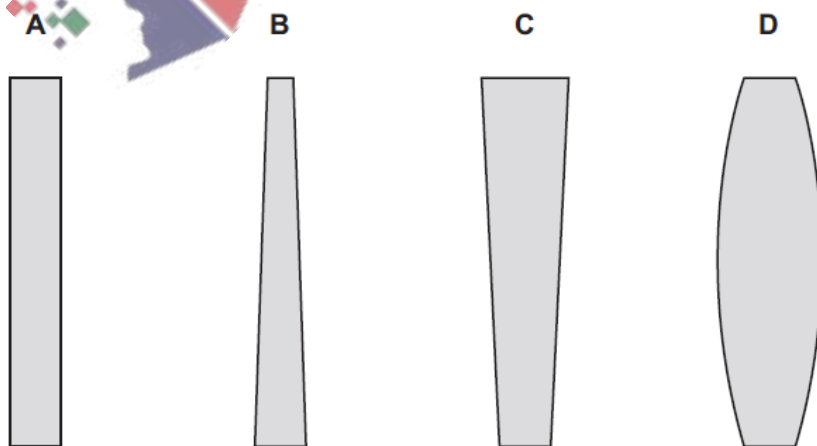
Which arrow represents the direction of the resultant force acting on the Moon at the instant shown?



2. June/2022/Paper_11/No.6

Four glass objects have square bases of equal area.

Which object is the least stable?



3. June/2022/Paper_12/No.1

A force of 3.0 N and a force of 4.0 N act on an object.

What is the maximum possible resultant of these two forces?

- A 1.0 N B 5.0 N C 7.0 N D 12 N

4. June/2022/Paper_12/No.4

A 60 kg passenger enters a stationary lift. The gravitational field strength g is 10 N/kg.

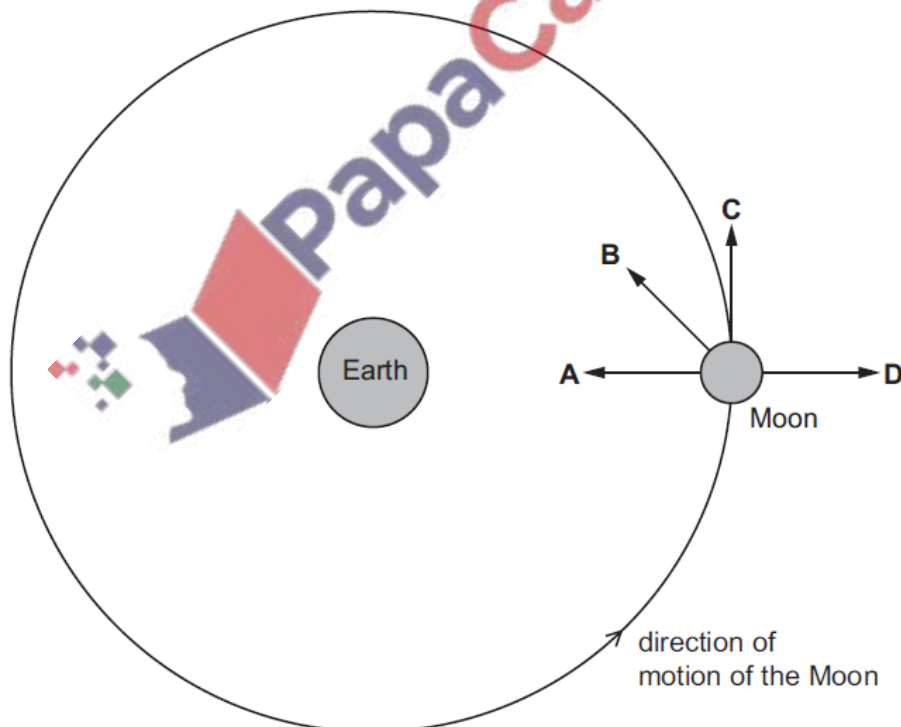
How much force does the floor of the lift exert on the passenger when the lift accelerates upwards at 2.0 m/s^2 ?

- A 120 N B 480 N C 600 N D 720 N

5. June/2022/Paper_12/No.5

The diagram represents the Moon in its orbit around the Earth.

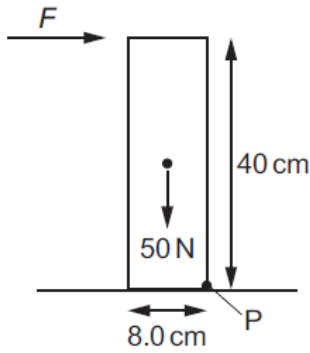
Which arrow represents the direction of the resultant force acting on the Moon at the instant shown?



6. [June/2022/Paper_12/No.7](#)

The diagram shows a uniform solid rectangular block of weight 50 N that is pivoted about point P.

The height of the block is 40 cm. The base of the block is 8.0 cm wide.

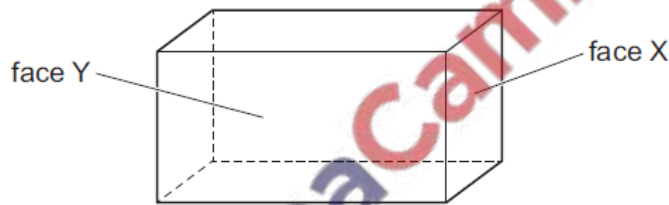


Which horizontal force F just makes the block start to rotate about P?

- A 2.5 N B 5.0 N C 10 N D 160 N

7. [June/2022/Paper_12/No.8](#)

The centre of mass of a solid rectangular block is at its centre. A small heavy weight is available.



In which arrangement is the centre of mass the lowest?

- A with face X on a table
B with face Y on a table
C with face X on a table and the heavy weight attached centrally on top of the block
D with face Y on a table and the heavy weight attached centrally on top of the block

8. [June/2022/Paper_12/No.10](#)

An elastic spring has an unstretched length of 30 cm.

A load of 6.0 N is hung from the spring and the length of the spring is now 66 cm.

The 6.0 N load is removed and the spring returns to its original length. A load of 2.0 N is now hung from the spring.

What is the new length of the spring?

- A 22 cm B 40 cm C 42 cm D 52 cm

Fig. 1.1 shows a model of the human arm. The rubber band represents the muscle that moves part of the arm XY up.

A mass is suspended from XY, as shown in Fig. 1.2. The weight of section XY is negligible and the model is at rest.

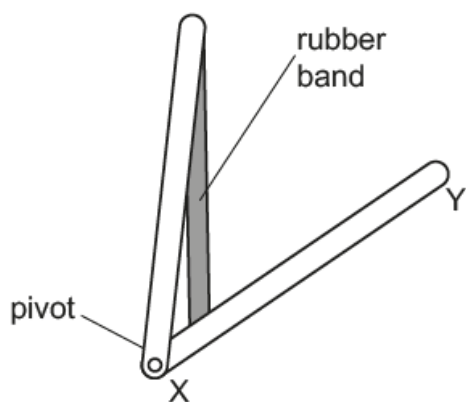


Fig. 1.1

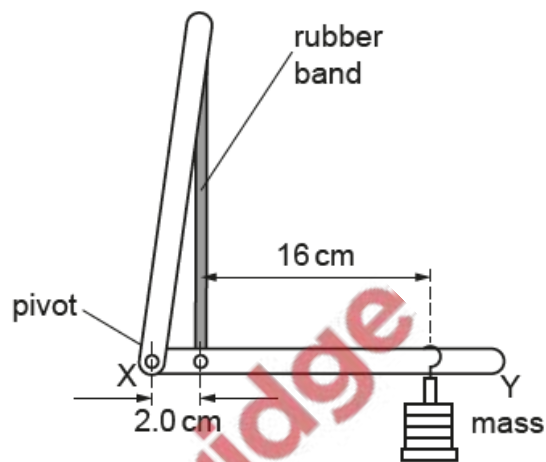


Fig. 1.2 (not to scale)

- (a) (i) State **two** ways in which the dimensions of the rubber band change as the mass is added to section XY.

.....
 [2]

- (ii) State the form of energy stored in the stretched rubber band.

..... [1]

- (b) (i) State the principle of moments.

.....

 [2]

(ii) Explain why the force that the rubber band exerts on section XY is larger than the weight of the mass.

.....
.....
..... [1]

(iii) The mass suspended from section XY in Fig. 1.2 has a weight of 4.0 N.

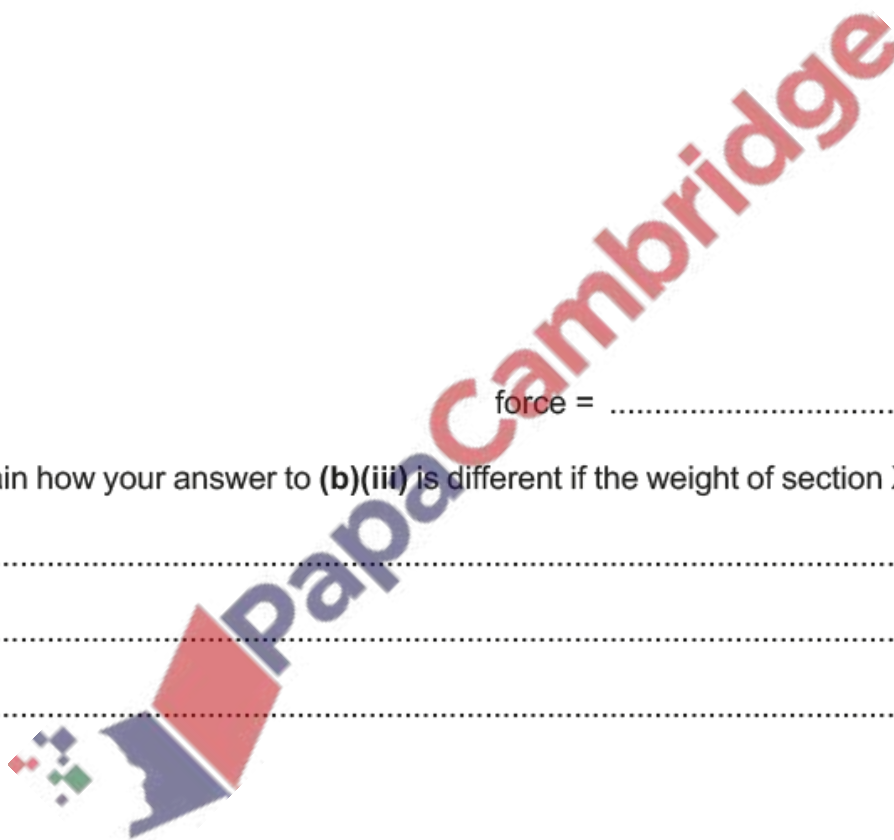
Calculate the force that the rubber band exerts on section XY.

force = [2]

(iv) Explain how your answer to (b)(iii) is different if the weight of section XY is **not** negligible.

.....
.....
..... [1]

[Total: 9]



10. June/2022/Paper_22/No.1(c)

(c) A boat pulls the waterskier to the right with a horizontal force of 50 N. The waterskier travels at a constant speed.

(i) Explain, in terms of the horizontal forces acting, why the speed is constant.

.....
..... [2]

(ii) The horizontal force acting to the right increases from 50 N to 70 N. The sizes of any other forces are unchanged.

Calculate the acceleration of the waterskier.

acceleration = [3]

