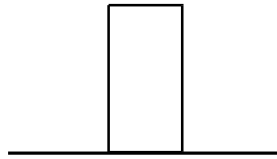


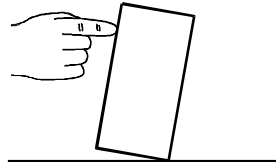
Moments & Stability PPQs

Name

1. A child stands a wooden brick on its end as shown in the diagram.



The child then pushes the brick to make it tilt.



How far must the brick be tilted to make it fall over?

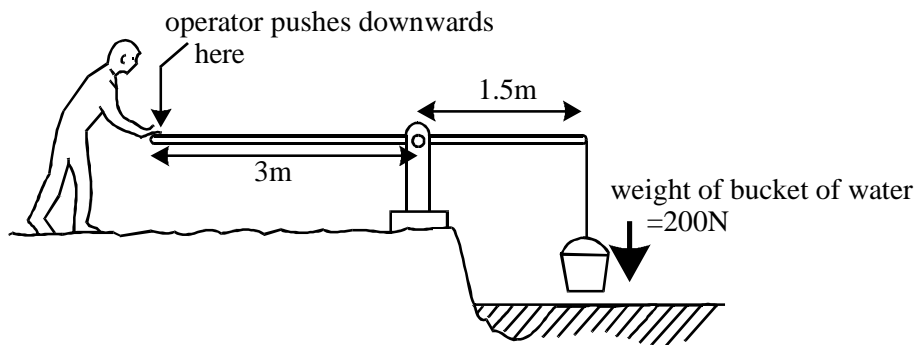
Explain your answer.

(You may draw a labelled diagram if you wish.)

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(Total 2 marks)

2. The diagram shows a simple machine for lifting water from a river.



- (a) Calculate the turning force (moment) of the bucket of water.

(Show your working.)

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Answer Nm (newton metre)

- (b) What can you say about the size of downwards force the operator must use to balance the moment of the bucket of water?

(Explain your answer, using numbers if you can.)

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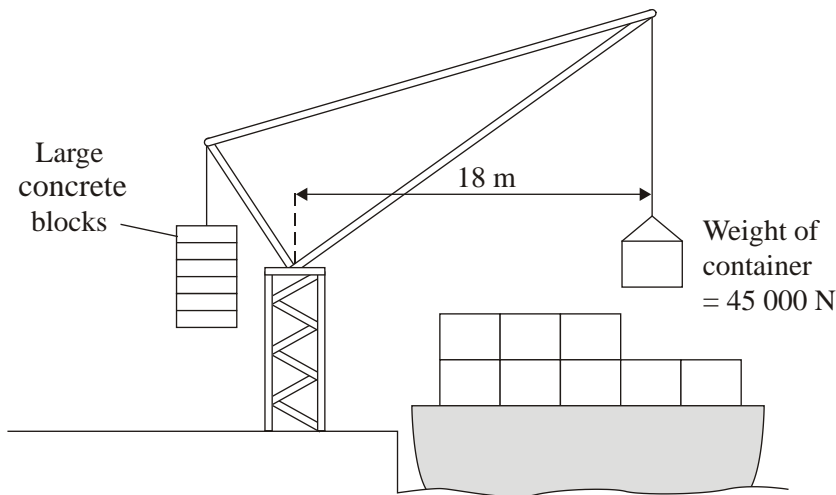
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(4)
(Total 6 marks)

3. The diagram shows a crane which is loading containers onto a ship.



- (a) Use the equation in the box to calculate the moment of the container which is being loaded.

$\text{moment} = \text{force} \times \text{perpendicular distance from the line of action of the force to the axis of rotation}$
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Show clearly how you work out your answer and give the unit.

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Moment of the container =

(3)

- (b) Suggest and explain the purpose of the large concrete blocks.

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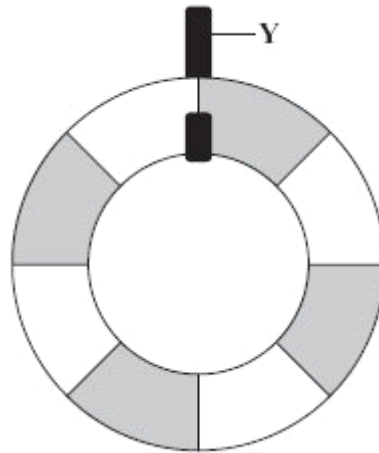
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(3)
(Total 6 marks)

4. (a) The diagram shows a lifebelt. It is hanging freely from hook **Y**.
- (i) On the diagram, mark with an **X** the point where you think the centre of mass of the lifebelt will be.



(1)

- (ii) Explain why you have chosen this point.

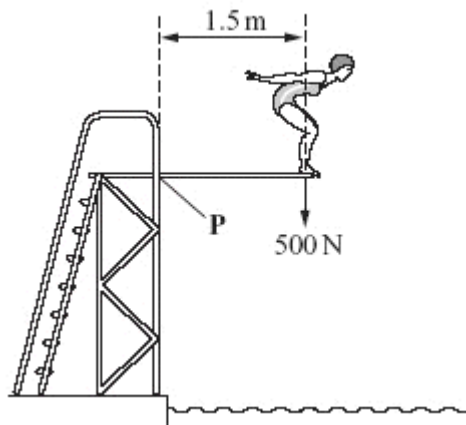
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(2)

- (b) The drawing shows Susan on a diving board. She is 1.5 metres from point **P** and she weighs 500 N.



Calculate her moment (turning effect) about point **P**.
 Show clearly how you work out your answer and give the unit.

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Moment about **P** =

(3)

(c) Susan has a case with wheels.



When she packs this case, she puts the heaviest items at the end where the wheels are. This means that the heaviest items are less likely to crush the other contents and it helps her to find things when she opens the case.

Explain another advantage of packing her case in this way.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

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(4)
(Total 10 marks)