Moments, levers and gears

1 **Complete the following sentence with the words below.** (4 marks, ★★)

A force or a .... of forces can cause an object to .... The ....

effect of a force is also called the .... of the force.

momentum	rotate	system	turning	terminal	moment	float

2 **Tick the correct unit for a moment.** (1 mark, ★★★★)

Nm	
Ns	

kg/m³	
kgm/s	

3 **A student predicts that the beam below would be balanced.**

Use a calculation to show whether they are correct. (3 marks, ★★★)

....

....

....

40 N   50 N

10 m   8 m
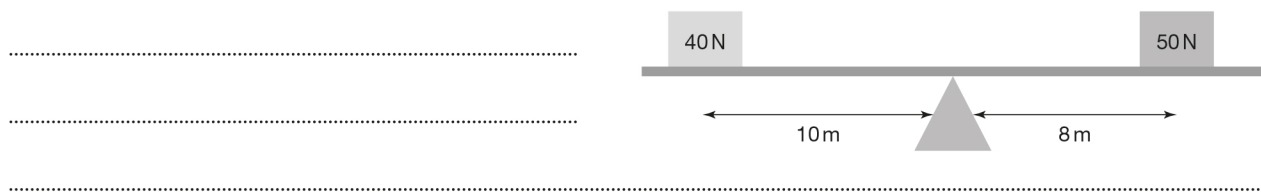
NAILIT!

A moment is the force multiplied by the perpendicular distance from the pivot.

Remember to state the conservation of momentum law:

anticlockwise moments = clockwise moments.

DOIT!

All students find moments questions hard. The only solution is to keep practising the problems until you gain confidence.
Remember:

1 Choose a point on the beam.

2 Ignore the forces acting through that point.

3 Anticlockwise moments = clockwise moments.

WORKIT!

What distance must the 50 N weight be from the pivot to balance the beam? (3 marks, ★★)

State equation

Force × distance = force × distance (1)

Substitute in the values

4 N × 12 m = 50 N × y (1)

Solve equation

$y = \dfrac{4 \times 12}{50} = 0.96\,m$ (1)

4 N   50 N

12 m   ??

We are calling the unknown distance y