

Principle of moments

When a bar resting on a pivot is balanced, the moment of all the forces tending to make the bar rotate in a clockwise direction is balanced by an equal moment in an anticlockwise direction.

Therefore, for objects in equilibrium:

sum of anticlockwise moments = sum of clockwise moments

This is called the principle of moments.

In this example, we can use the principle of moments to check that the bar is in equilibrium:

sum of anticlockwise moments = $3.0 \times 2.0 + 1.0 \times 4.0 = 10 \text{ Nm}$

sum of clockwise moments = $2.0 \times 3.0 + 4.0 \times 1.0 = 10 \text{ Nm}$

This confirms that the bar is in equilibrium.