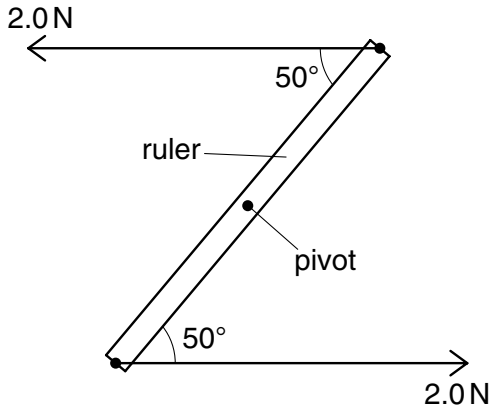
13 A ruler of length 0.30 m is pivoted at its centre. Equal and opposite forces of magnitude 2.0 N are applied to the ends of the ruler, creating a couple as shown.



What is the magnitude of the torque of the couple on the ruler when it is in the position shown?

A 0.23 Nm **B** 0.39 Nm **C** 0.46 Nm **D** 0.60 Nm

14 A cylindrical block of wood has a cross-sectional area A and weight W. It is totally immersed in water with its axis vertical. The block experiences pressures p_t and p_b at its top and bottom surfaces respectively.

Which of the following expressions is equal to the upthrust on the block?

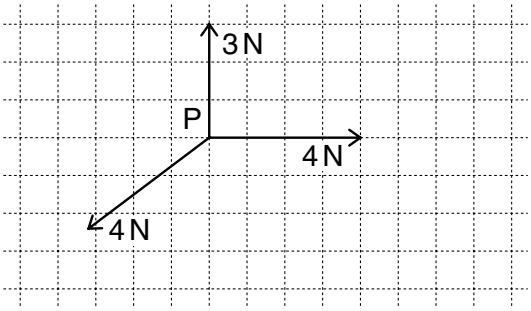
A $(p_b - p_t)A + W$

B $(p_b - p_t)$

C $(p_b - p_t)A$

D $(p_b - p_t)A - W$

15 The vector diagram shows three coplanar forces acting on an object at P.



The magnitude of the resultant of these three forces is 1 N.

What is the direction of this resultant?

A ↓ **B** ↘ **C** ↙ **D** ↗