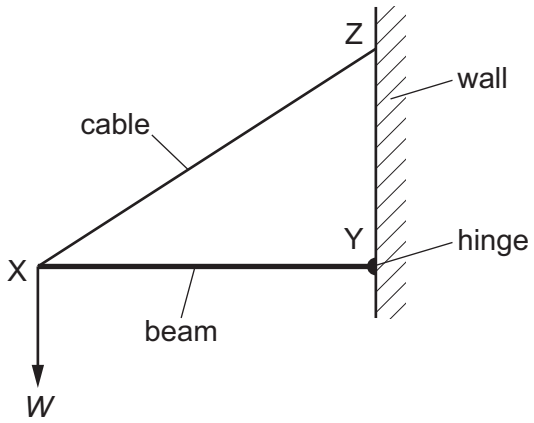
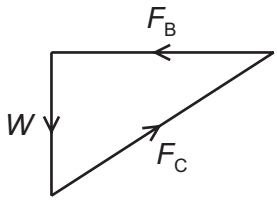
**12** A thin horizontal beam XY is freely hinged at point Y to a vertical wall. The beam is held stationary by a cable XZ which is attached to the wall at point Z.



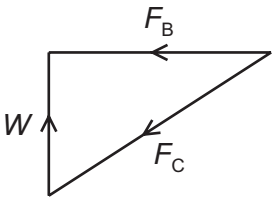

The beam supports a weight $W$ at point X. The forces in the cable and the beam are $F_C$ and $F_B$ respectively.

Which vector triangle represents the forces acting on point X?

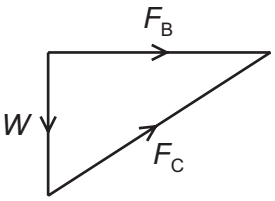
**A**



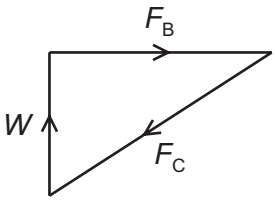

**B**



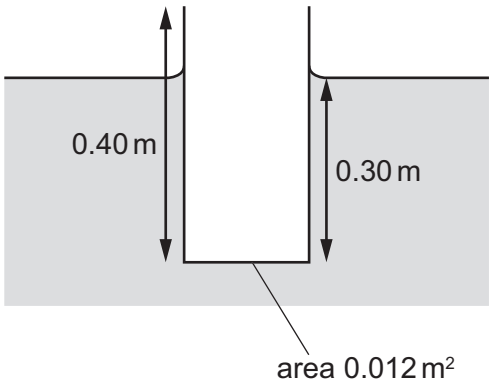

**C**




**D**




**13** A pipe, open at one end, floats in a liquid as shown.




The cross-sectional area of the pipe is $0.012\,m^2$. The weight of the pipe is 32 N.

What is the density of the liquid?

**A** $680\,kg\,m^{-3}$ **B** $910\,kg\,m^{-3}$ **C** $6700\,kg\,m^{-3}$ **D** $8900\,kg\,m^{-3}$