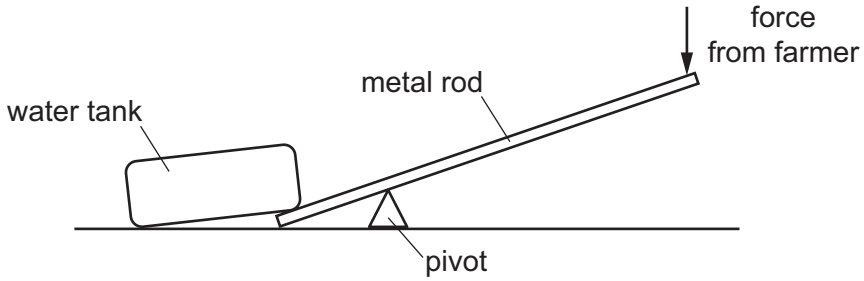
12 A farmer is trying to lift the corner of a large water tank. She uses a metal rod as a lever.



The vertical force from the farmer is constant and is always applied to the end of the rod.

Which change **must** increase the upward force on the water tank?

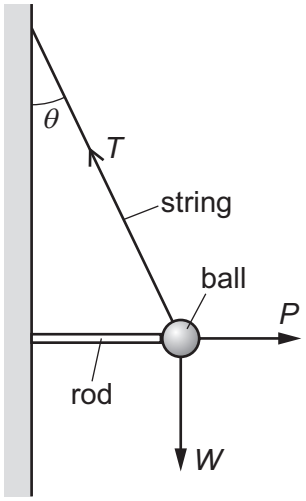
A using a longer rod and moving the pivot closer to the tank

B using a longer rod and moving the pivot further away from the tank

C using a shorter rod and moving the pivot closer to the tank

D using a shorter rod and moving the pivot further away from the tank

13 The diagram shows a ball of weight W hanging in equilibrium from a string.



The string is at an angle θ to the vertical. The tension in the string is T. The ball is held away from the wall by a horizontal force P from a metal rod.

Which relationship between the magnitudes of T, P and W is correct?

A $P = T\cos\theta$ and $W = T\sin\theta$

B $T = P + W$

C $T^2 = P^2 + W^2$

D $W = P\tan\theta$ and $W = T\cos\theta$