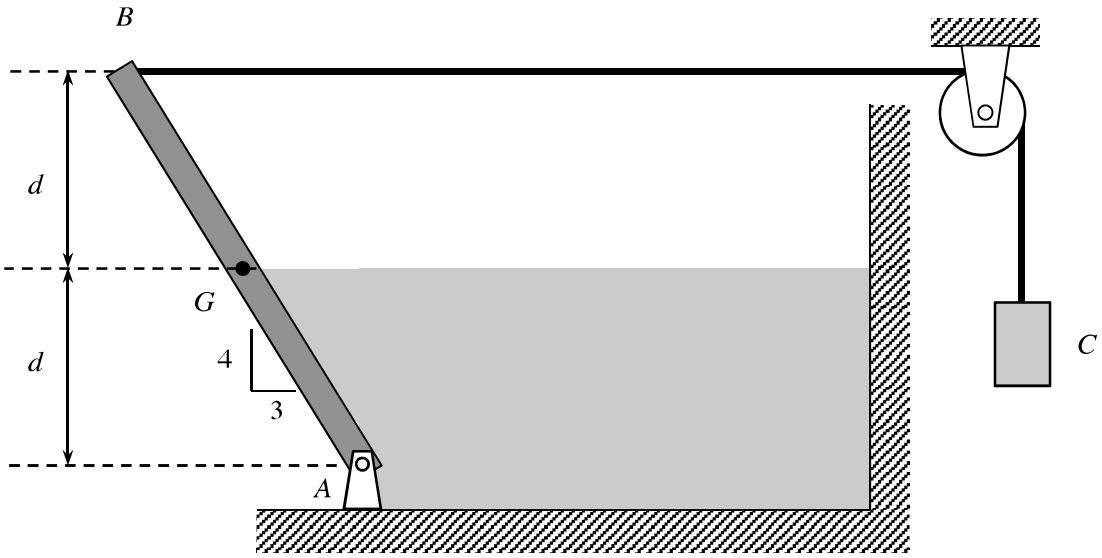
Homework H16.A

Given: A water gate is supported by a pin joint at A and a cable-pulley system at B.. A counterweight C is attached to the end of the cable. The gate has a dimension into the page of *b*. The water has a density of ρ, and the weight of the gate is negligible compared to the weight of the water that it supports.

Find: Determine the weight of C required to hold the gate in equilibrium.

Leave your answer in terms of, at most: *d*, *b, g* and *ρ.*



Homework H16.B

Given: A water gate has a cross section as shown below that is made up of horizontal and angled sections, and has a depth dimension into the page of *b*.. The gate is pinned to ground at O and is held against a fixed stop at A. The water has a density of ρ. The weight of the gate can be assumed to be negligible compared to the hydrostatic forces acting on it.

Find: For this problem:

a) Draw a free body diagram of the gate and the water above it, including hydrostatic loadings, weight of the water and the reaction forces.

b) Determine the equivalent forces for the hydrostatic forces and their points of application.

c) Determine the load carried by the stop at A.

Leave your answers in terms of, at most: *d*, *b, g* and *ρ.*