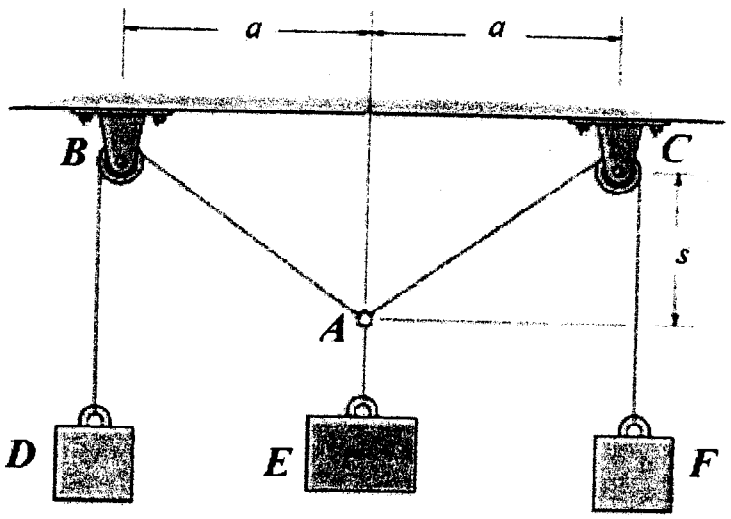
1. (Blocks D and F weigh W_1 each and block E weighs W_2.
Determine the sag s for equilibrium. Neglect the size of the pulleys.

Given:

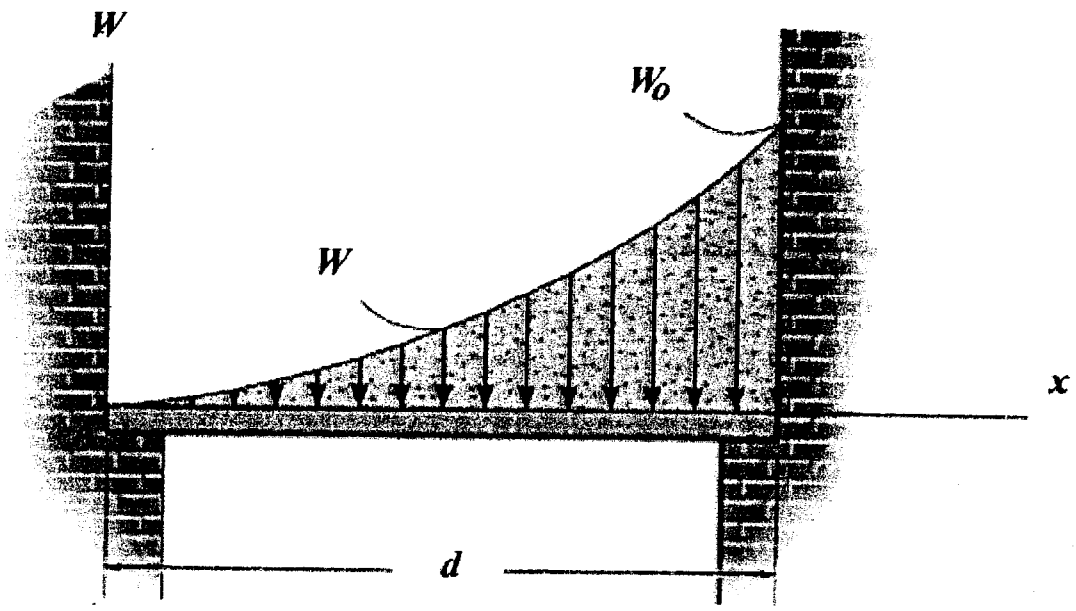
W_1 = 50 N
W_2 = 80 N
a = 1.2 m



2. Wind has blown sand over a platform such that the intensity of the load can be approximated by the function $w = w_o\left(\frac{x}{d}\right)^3$ Simplify this distributed loading to an equivalent resultant force and specify the magnitude and location of the force, measured from *A*.

Given:

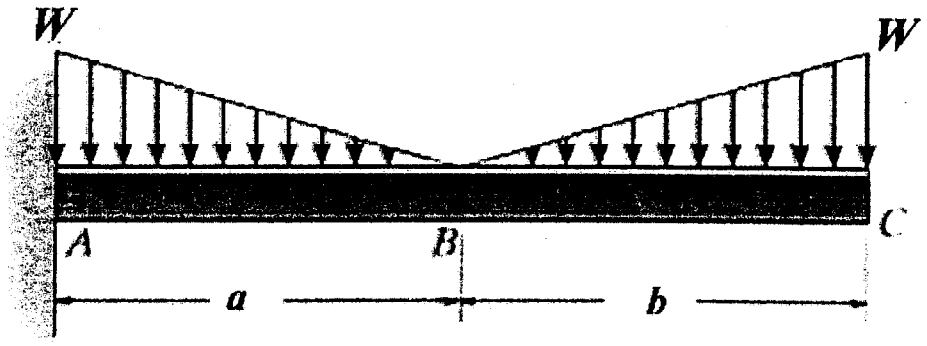
$w_O = 500$ N/m
$w = w_O(x/d)^3$
$d = 10$ m



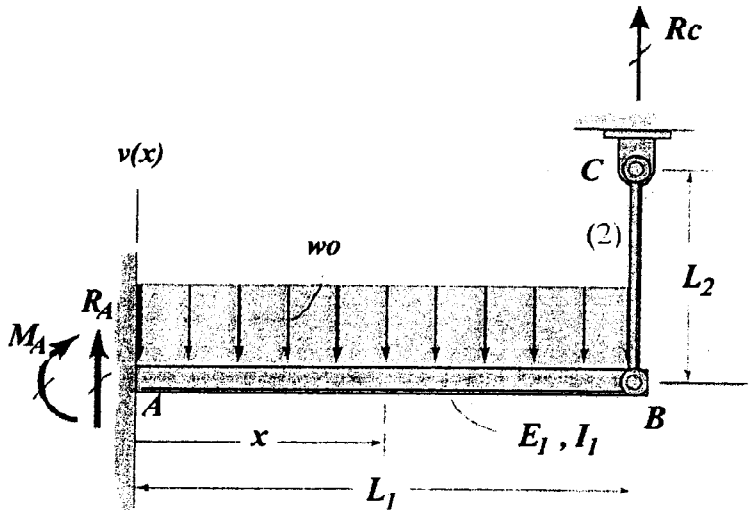
3. Draw the shear and moment diagrams for the beam.

Given:

$W = 2$ kN/m
$a = 3$ m
$b = 3$ m



4. At end B, the cantilever beam is pinned to a uniform rod whose cross-section area is A_2, whose length is L_2, and whose modulus of elasticity is E_2. The beam supports a uniformly distributed load of intensity w_0; its flexural rigidity is E_1I_1, and its length is L_1. (a) Use the second-order integration method to determine the reactions R_A and M_A at A, and the tension, F_2, in the rod. (b) Determine an expression for the deflection curve, $v(x)$, of the beam.



5. The state of plane stress at a point is given below. Please solve for the normal stress and shear stress on the indicated inclined plane NN.