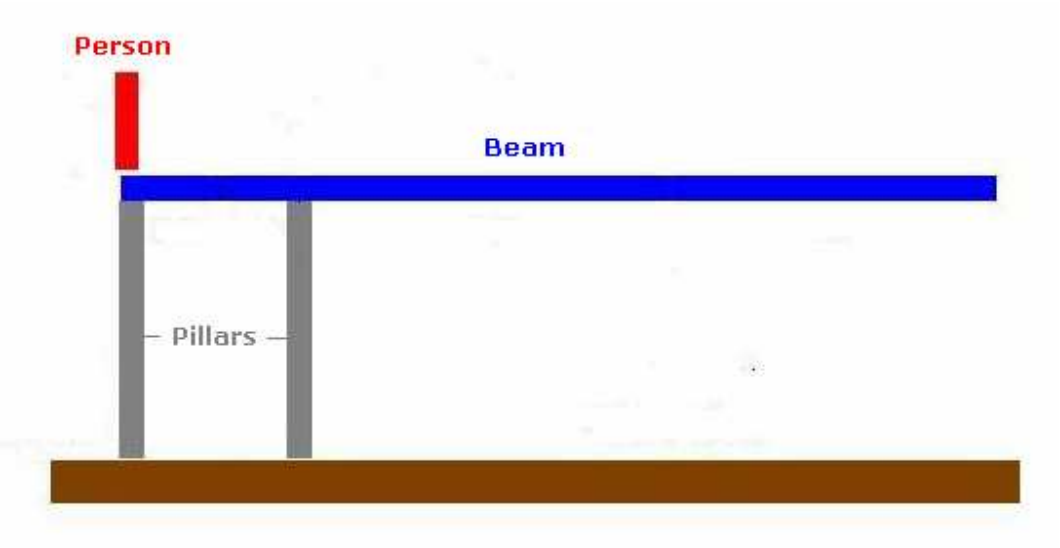
Fall Semester Advanced Placement Physics 2
John Dewey High School
Mr. Klimetz

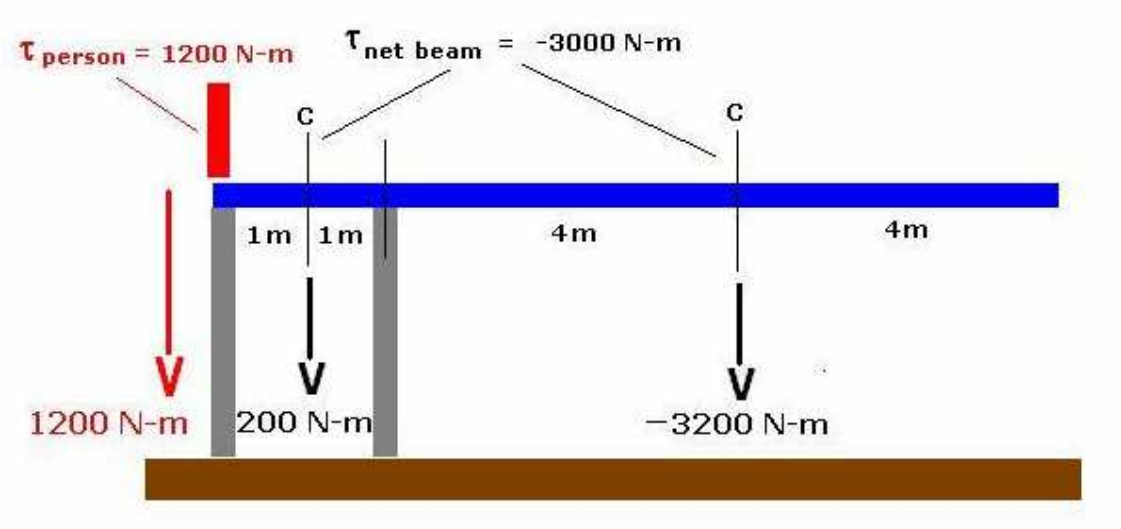
Torque on a Beam II

Problem: A person of mass 60 kg is walking down a 10 m, 100 kg beam supported by two pillars, one at the head of the beam and one 3m away from the center of the beam as shown below.



How far down the beam can the person walk before the beam begins to tip?
[Consider the origin to be the left end of the beam.]
[1] 0 m
[2] 2 m
[3] 2.5 m
[4] 6.67 m
[5] To the end of the beam

Solution:



$\tau_{net} = \tau_{person} + \tau_{net\ beam}$

$\tau_{net} = 1200\ N\text{-}m + [-3000\ N\text{-}m]$

$\tau_{net} = -1800\ N\text{-}m$

Beam is unstable!