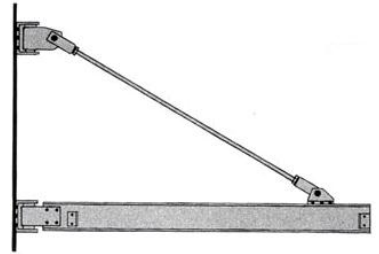


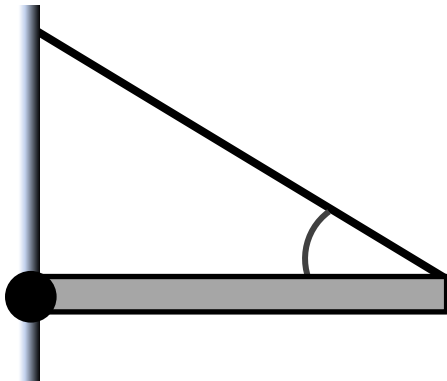
BEAM / SHELF AGAINST A WALL

- Some Static Equilibrium problems have shelf-like objects tensioned against a wall →
 - In these problems, the hinge (on the wall) applies a force against the beam.
 - The hinge always applies a horizontal force against the _____.
 - The hinge almost always applies a force _____ on the beam, to help hold it.
 - We'll assume H_y is _____, and if you get a negative for H_y , it means it was actually down – which is OK!



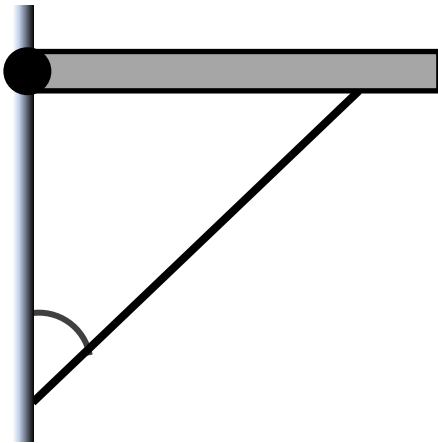
EXAMPLE: A beam 300 kg in mass and 4 m in length is held horizontally against a vertical wall by a hinge on the wall and a light cable, as shown. The cable makes an angle of 37° with the horizontal. Calculate the:

- Magnitude of the Tension force on the cable;
- Magnitude and direction of the Net Force the hinge applies on the beam.



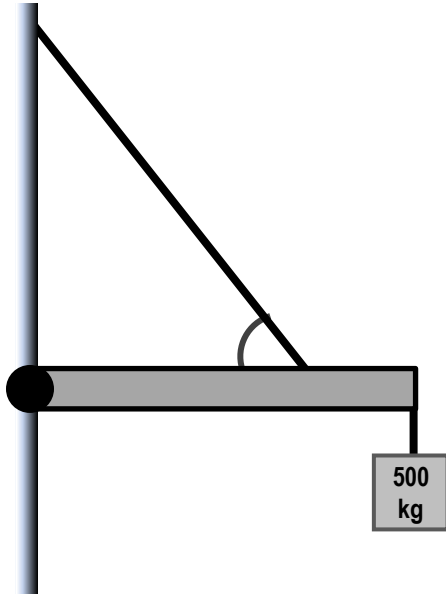
PRACTICE: BEAM SUPPORTED BY AN INCLINED ROD

PRACTICE: A beam 200 kg in mass and 6 m in length is held horizontally against a wall by a hinge on the wall and a light rod underneath it, as shown. The rod makes an angle of 30° with the wall and connects with the beam 1 m from its right edge. Calculate the angle that the Net Force of the hinge makes with the horizontal (use $+/-$ for above/below $+x$ axis).



EXAMPLE: BEAM SUPPORTING AN OBJECT

EXAMPLE: A beam 400 kg in mass and 8 m in length is held horizontally against a wall by a hinge on the wall and a light cable, as shown. The cable makes 53° with the horizontal and connects 2 m from the right edge of the beam. A 500 kg object hangs from the right edge of the beam. Calculate the magnitude of the net force the hinge applies on the beam.



PRACTICE: INCLINED BEAM AGAINST A WALL

PRACTICE: A beam 200 kg in mass and 4 m in length is held against a vertical wall by a hinge on the wall and a light horizontal cable, as shown. The beam makes 53° with the wall. At the end of the beam, a second light cable holds a 100 kg object. Calculate the angle that the Net Force of the hinge makes with the horizontal (use $+/-$ for above/below $+x$ axis).

