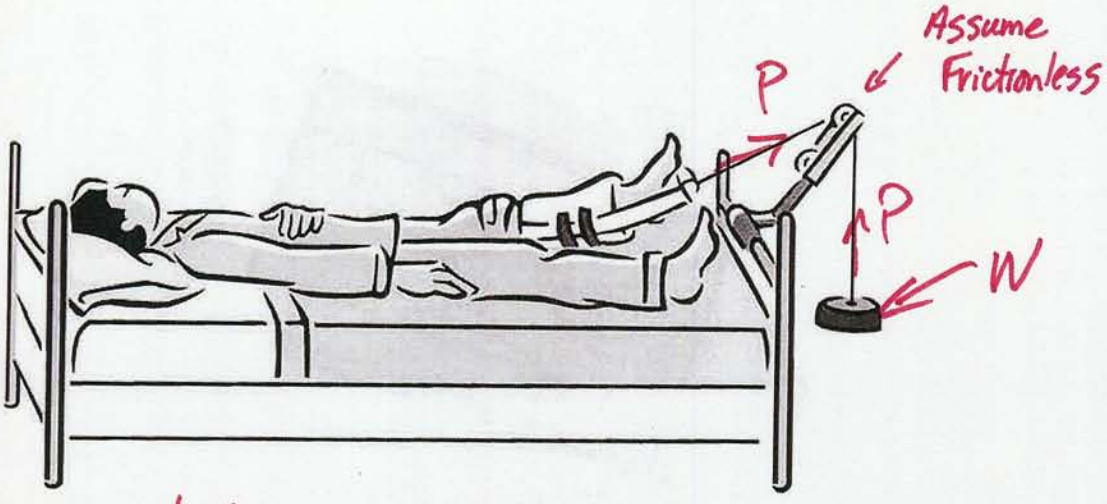
Problem 2: Friction

How much weight can be applied before the patient begins to slide towards the foot of the bed? What information do you need? What assumption must you make?

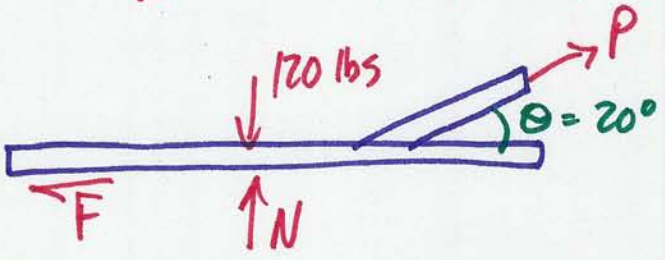


Assume body weight = 120 lb

$\theta = 20°$

$\mu_s = 0.5$ (Body + BED)

FBD



$\uparrow \Sigma F_y = 0 = -120 + N + P\sin 20° \Rightarrow N + .34P = 120$

$\rightarrow \Sigma F_x = 0 = -F + P\cos 20°, \; F = \mu_s N \Rightarrow -.5N + .94P = 0$

} SOLVE

IMPENDING SLIDING

$N = 101.6$ lbs ↑

$P = W = 54$ lbs ↓