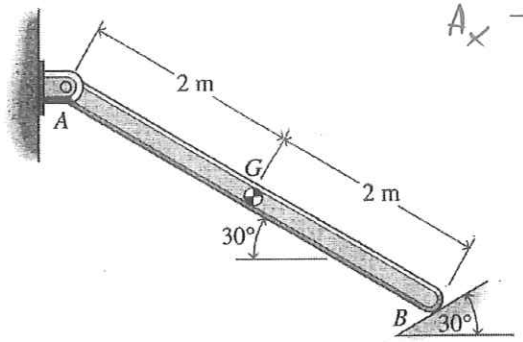
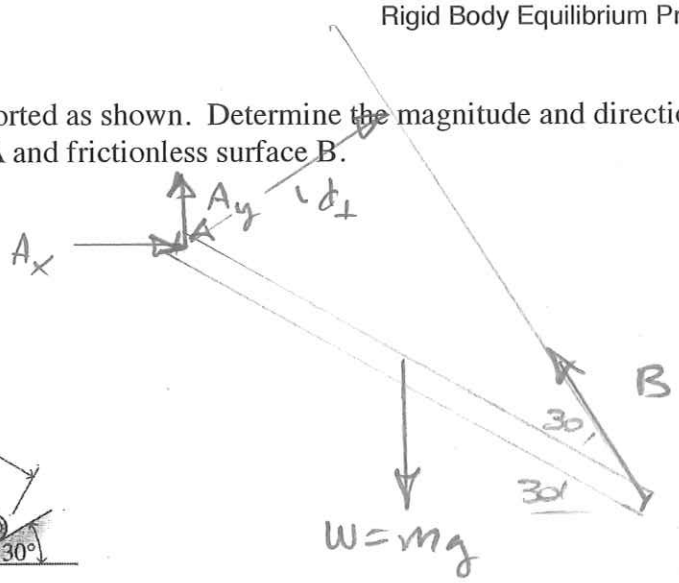
A 200 kg beam is is loaded and supported as shown. Determine the magnitude and direction of the reaction force at frictionless pin A and frictionless surface B.





$W = mg = 200(9.81) = 1962\ N$

$\Sigma M_A = 0$

$W(2\cos 30) = B(4\sin 30)$

$B = W\dfrac{2\cos 30}{4\sin 30} = 1700\ N$

$\Sigma F_x = 0$

$A_x = B_x$

$= B\cos 60$

$= 849\ N$

$\Sigma F_y = 0$

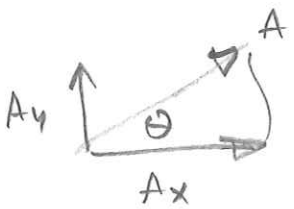
$A_y = W - B_y$

$= 1962 - B\sin 60$

$= 490\ N$

$A = \sqrt{A_x^2 + A_y^2} = 981\ N$

$\theta = \tan^{-1}\dfrac{A_y}{A_x} = 30°$



$\bar{A} = 981\ N \angle 30° \Delta$

$\bar{B} = 1700\ N \angle 60° \Delta$