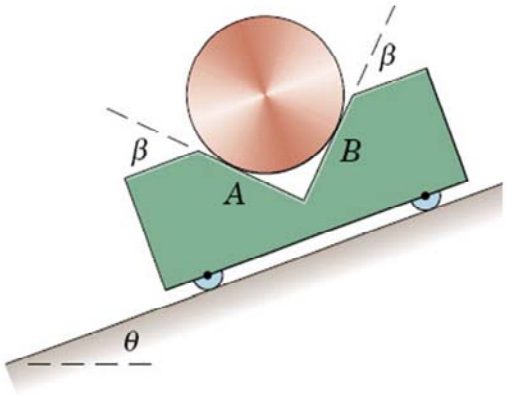
Rectilinear Motion: Exercise 1



A cylinder rests in a supporting carriage where $\beta = 45^o$ and $\theta = 30^o$.

Calculate the maximum ***acceleration*** a up the incline so that the cylinder does not lose contact with the carriage.

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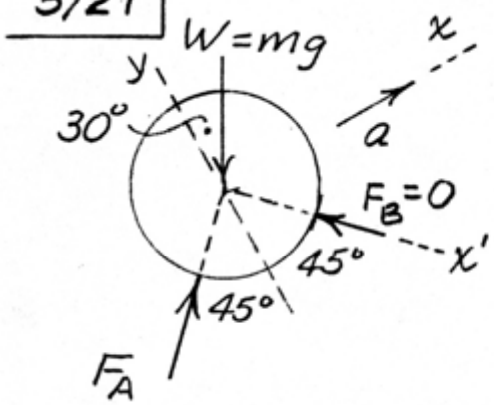

$\Sigma F_{x'} = ma_{x'}$;

$mg\cos(45°+30°) = ma\cos 45°$

$a = g\,\dfrac{\cos 75°}{\cos 45°} = 9.81\,\dfrac{0.2588}{0.7071}$

$= \underline{0.366g}$