Normal Force on an Inclined Plane

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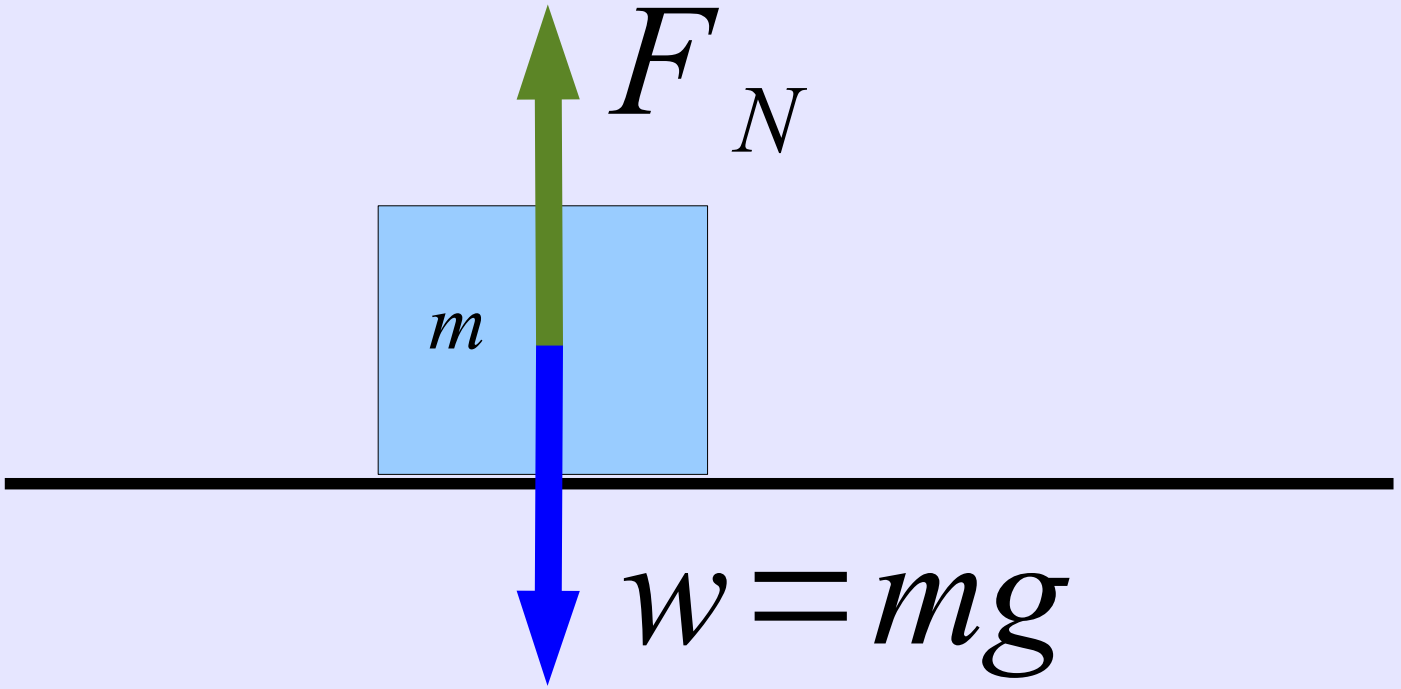
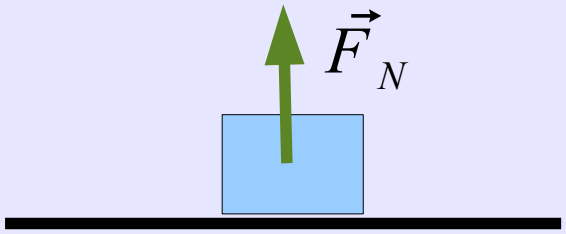
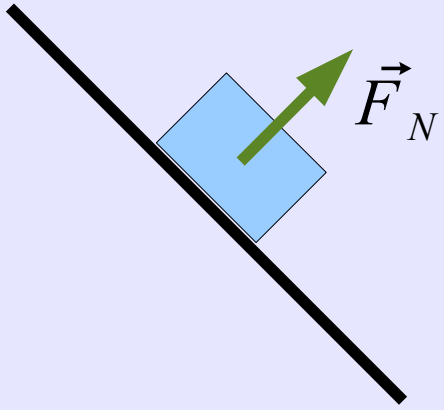
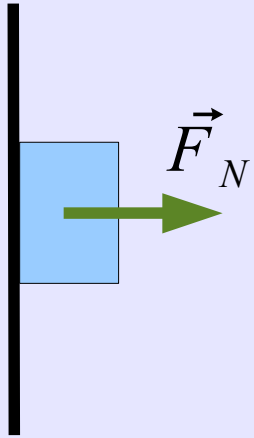
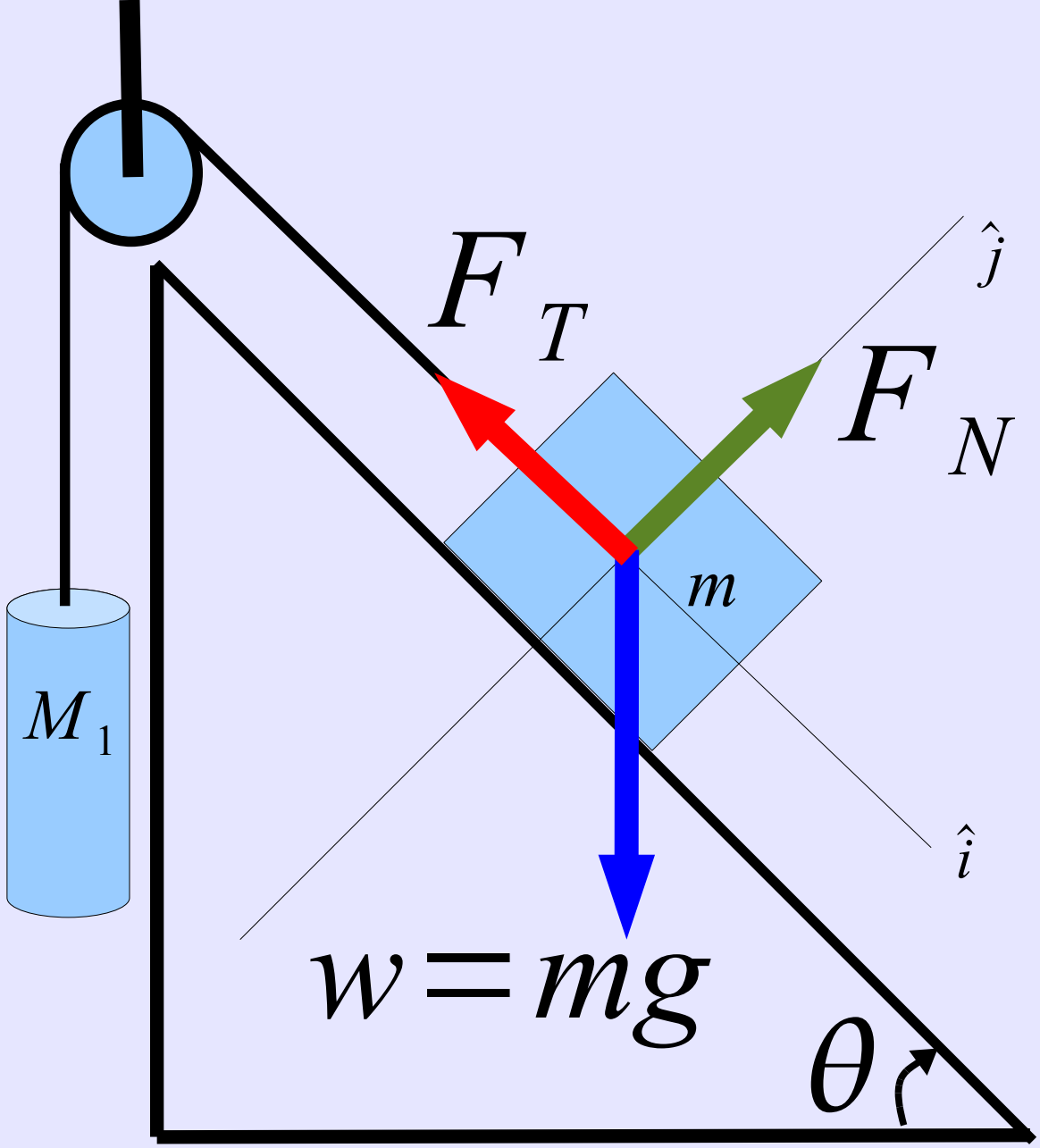


If an object is in contact with a surface, the Normal Force (F_N) is defined as a contact force which is perpendicular to the surface.

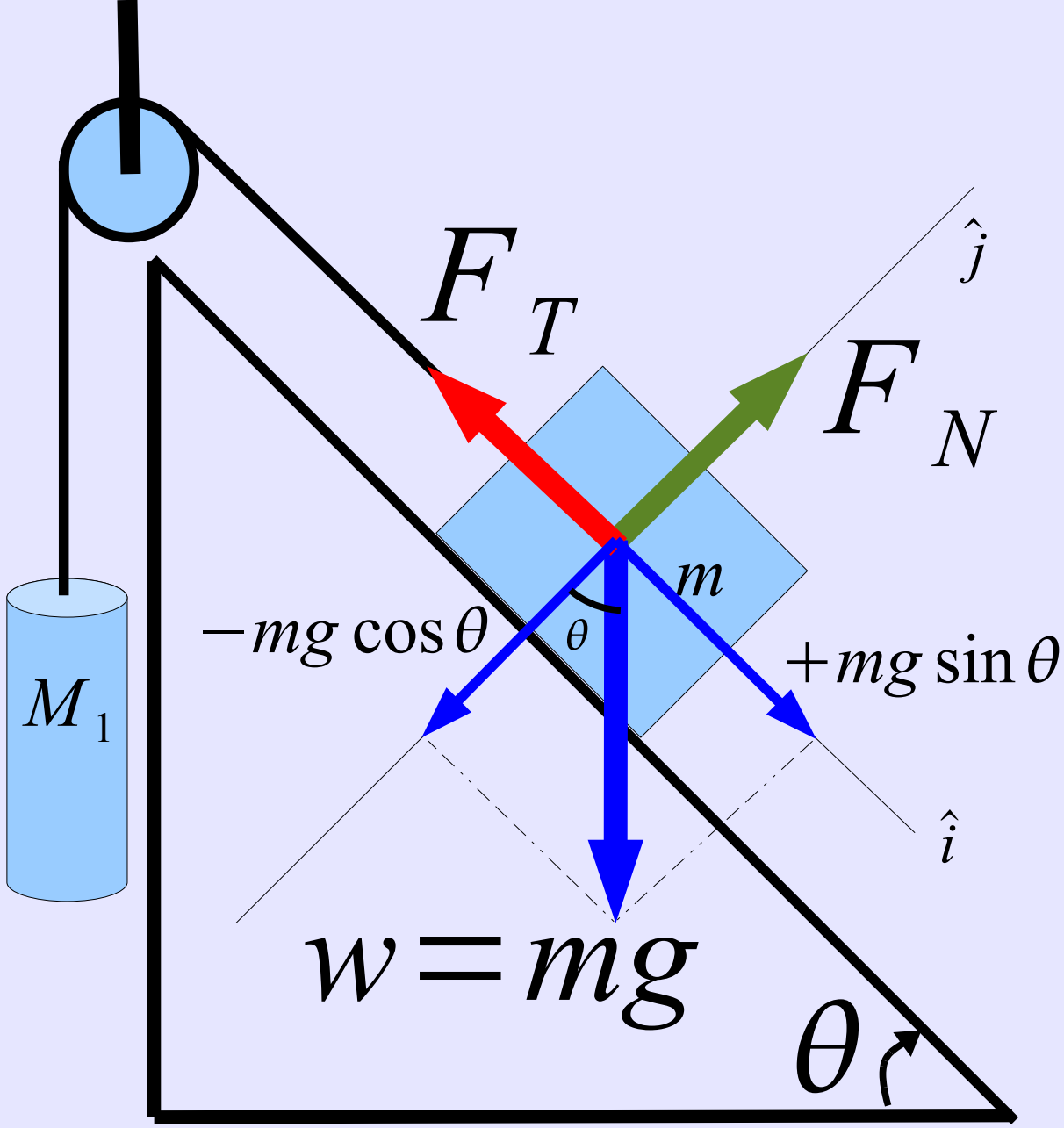


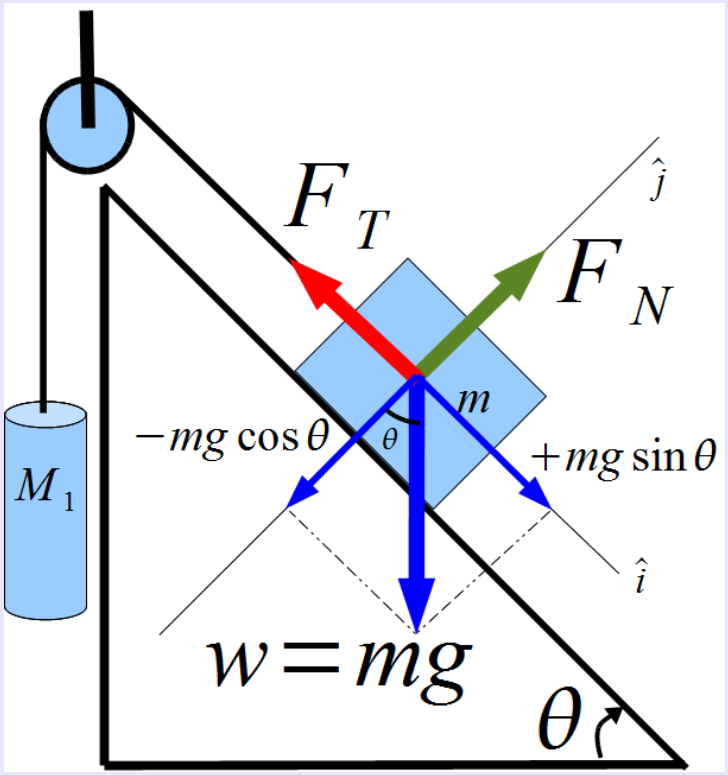




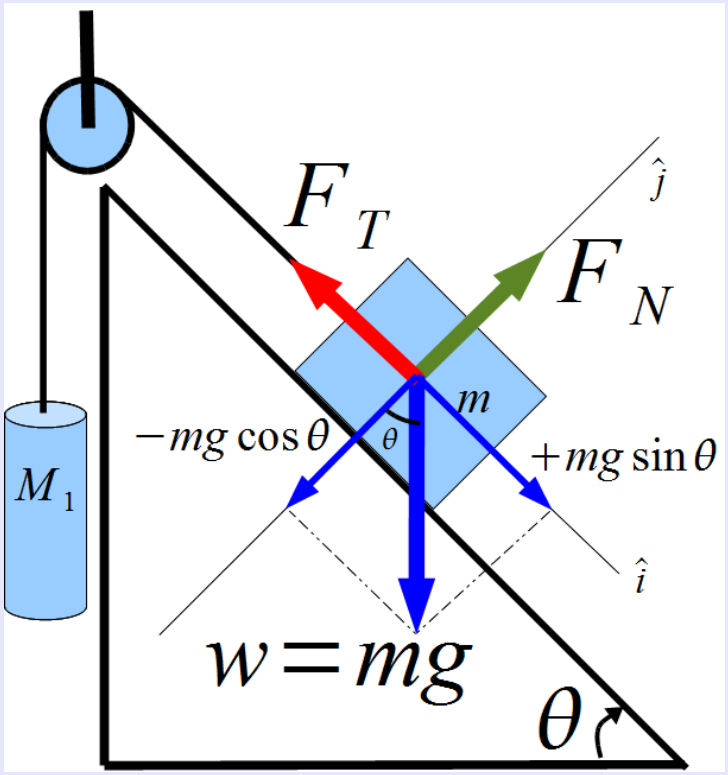


Consider a mass on an inclined plane with a hanging mass attached over a frictionless, massless pulley in *Static Equilibrium.*





Force	$\hat{i}$	$\hat{j}$
F_N	0	$+F_N$
F_T	$-F_T$	0
w	$+mg\sin\theta$	$-mg\cos\theta$



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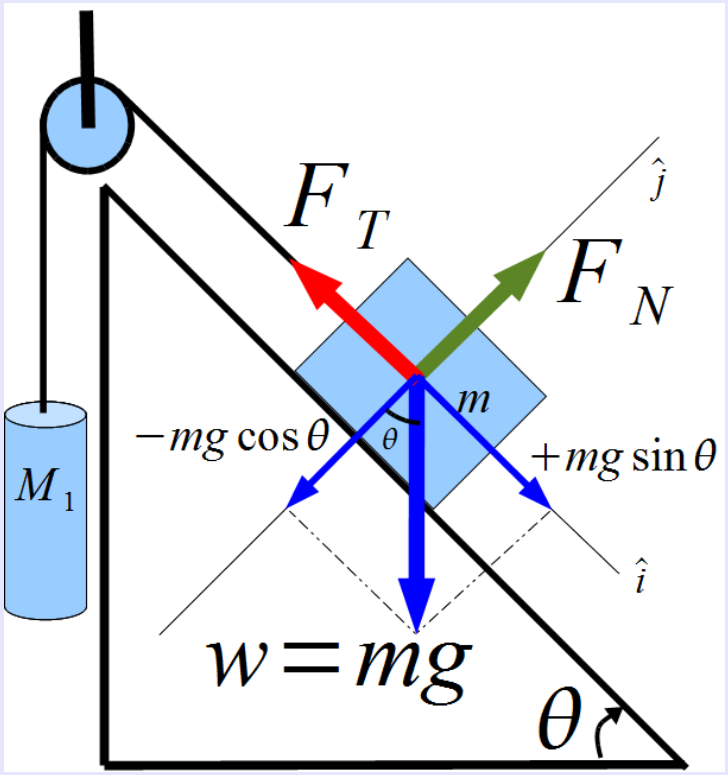
$$\sum F_x = +mg\sin\theta - F_T = 0$$

$$F_T = mg\sin\theta$$



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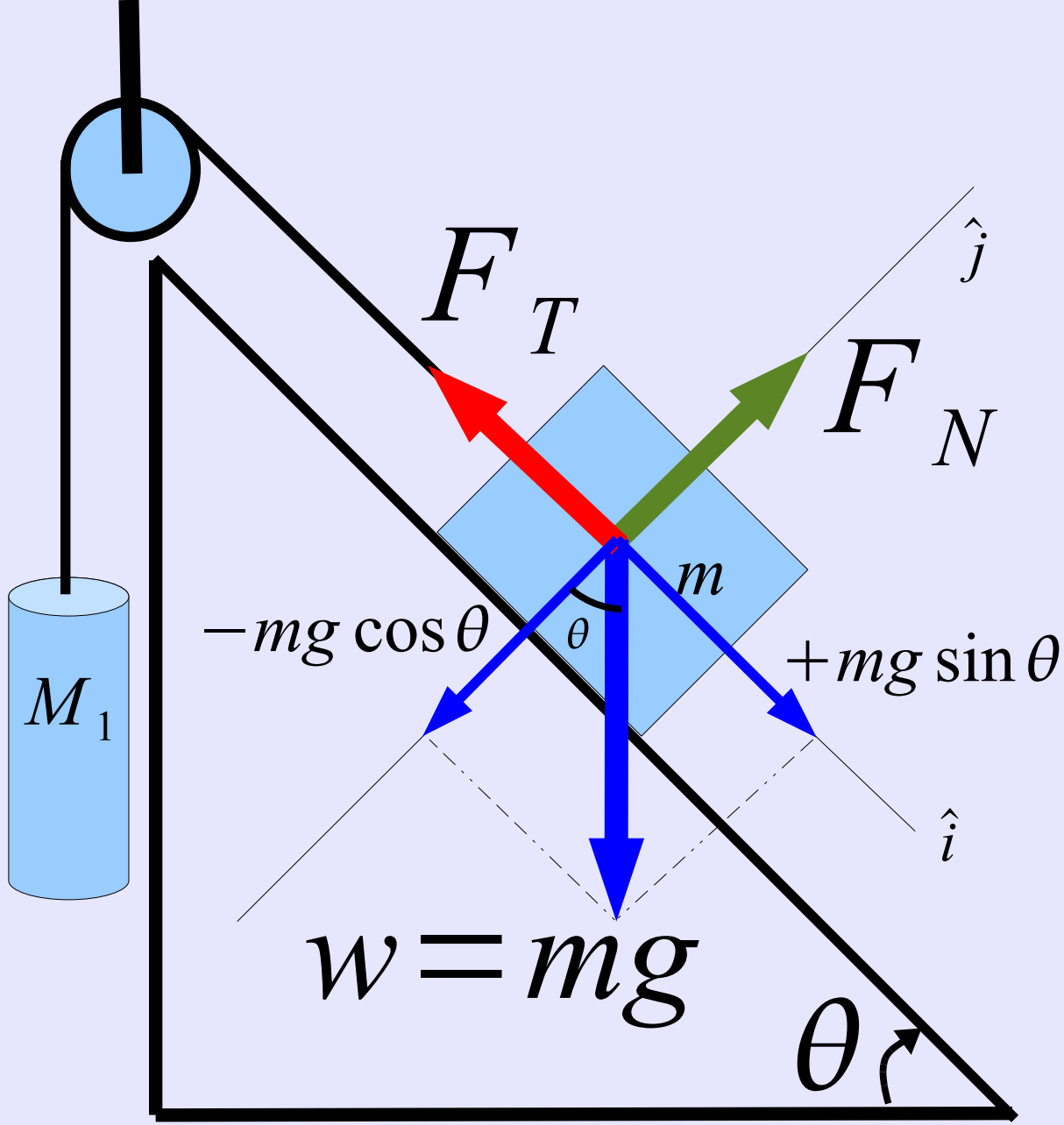
$$F_T = mg\sin\theta$$

$$\sum F_y = F_N - mg\cos\theta = 0$$

$$F_N = mg\cos\theta$$

The ramp, or rather, the Normal Force, may be replaced by another force that is equal in magnitude to the Normal Force and perpendicular to the surface.



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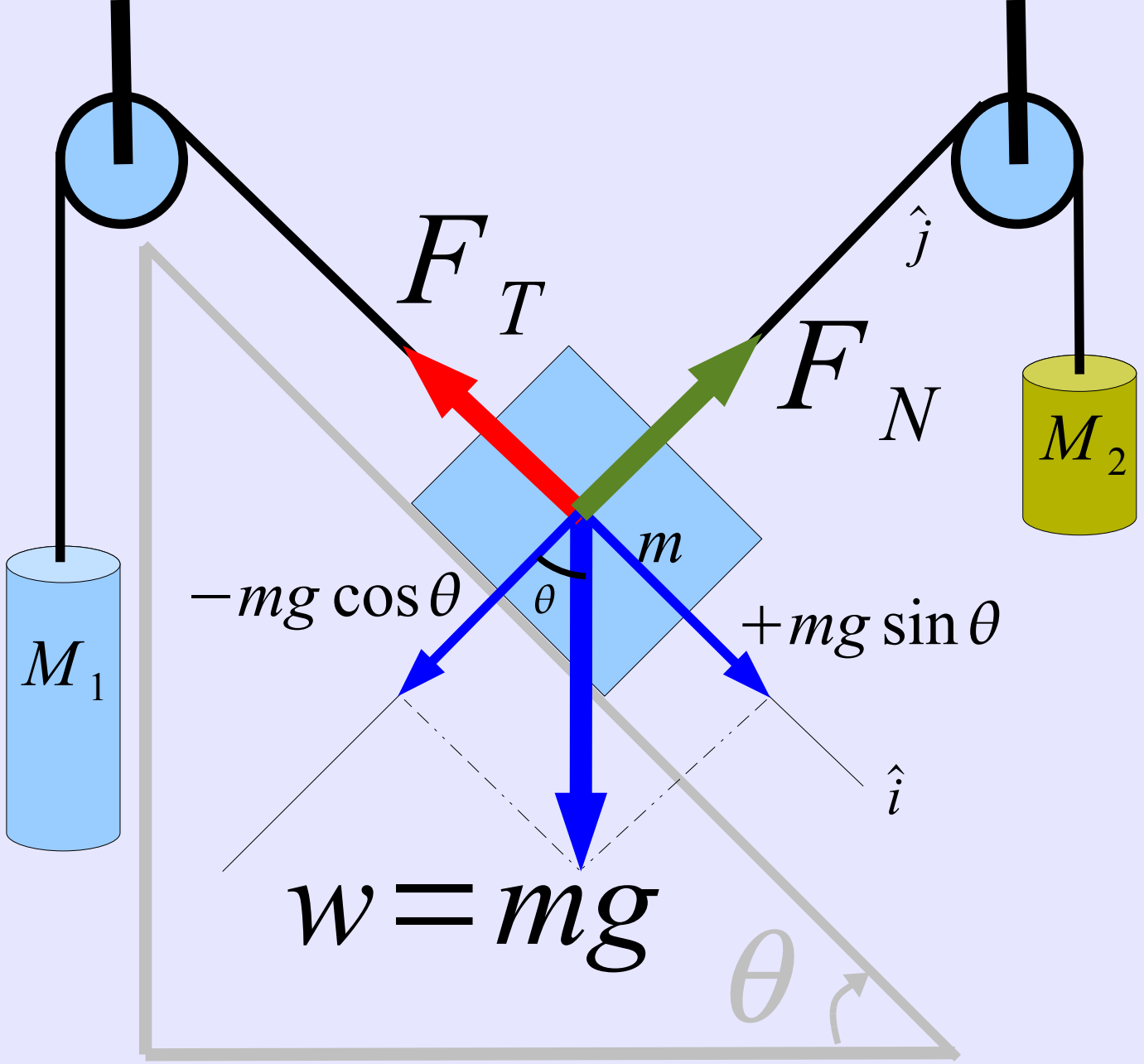

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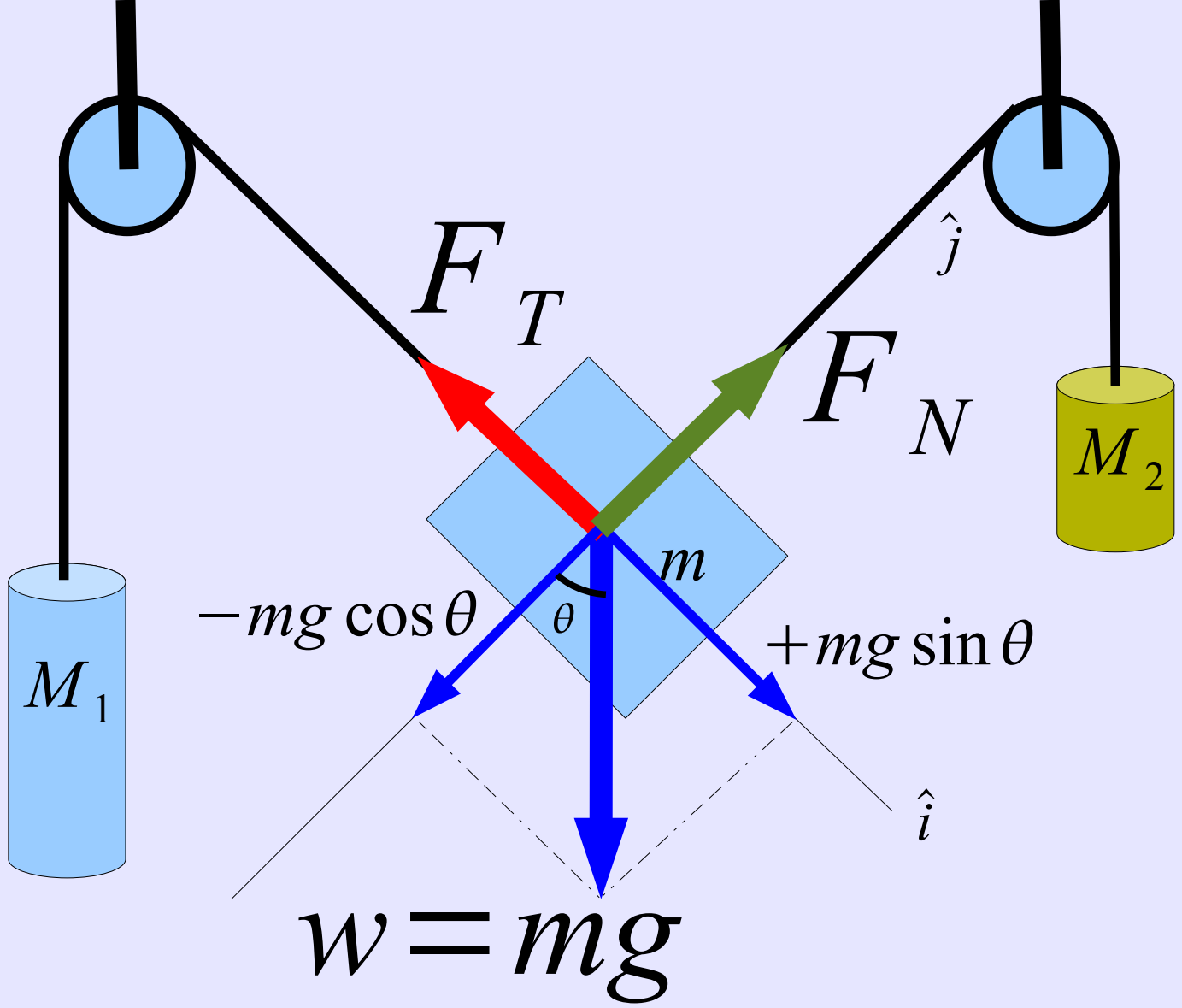
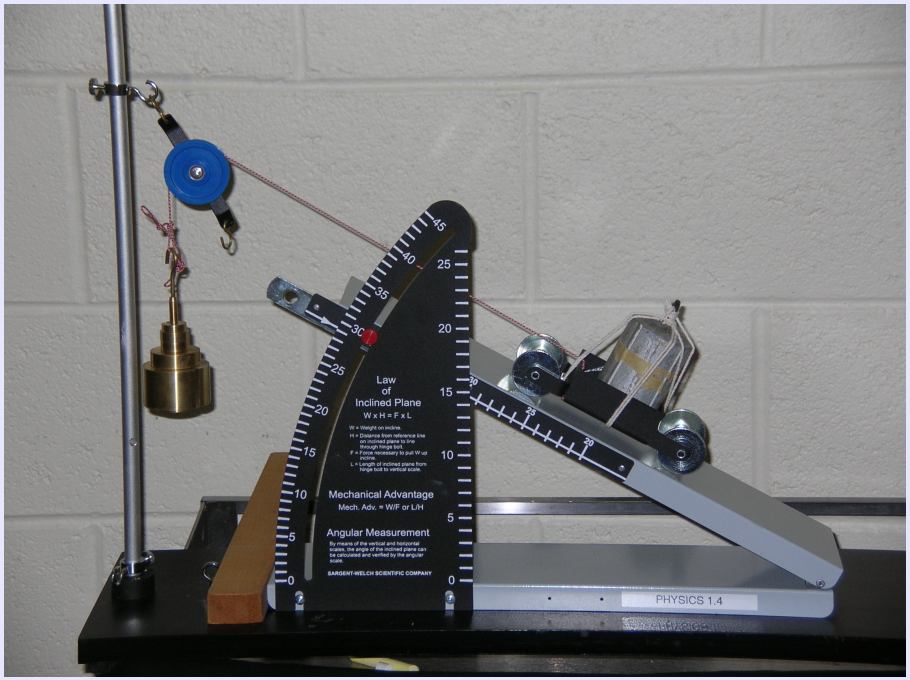
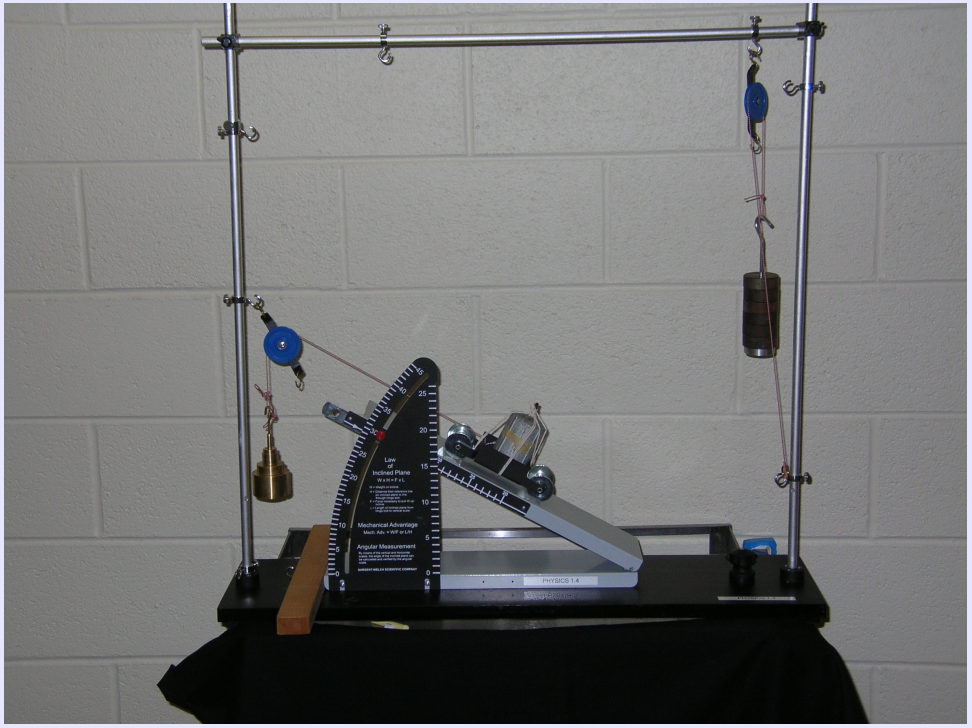
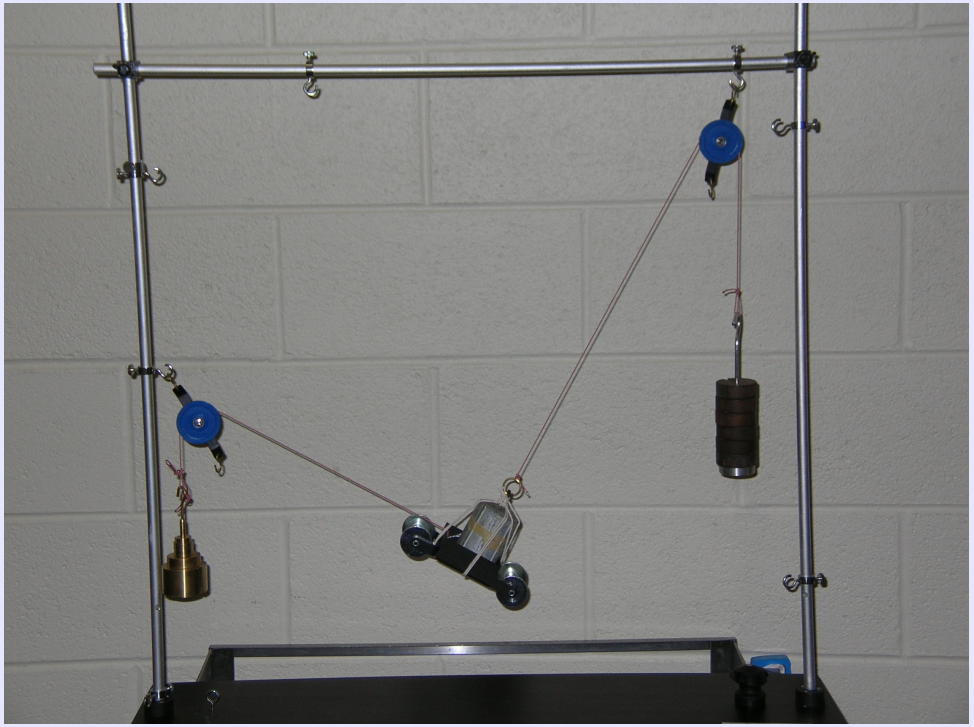
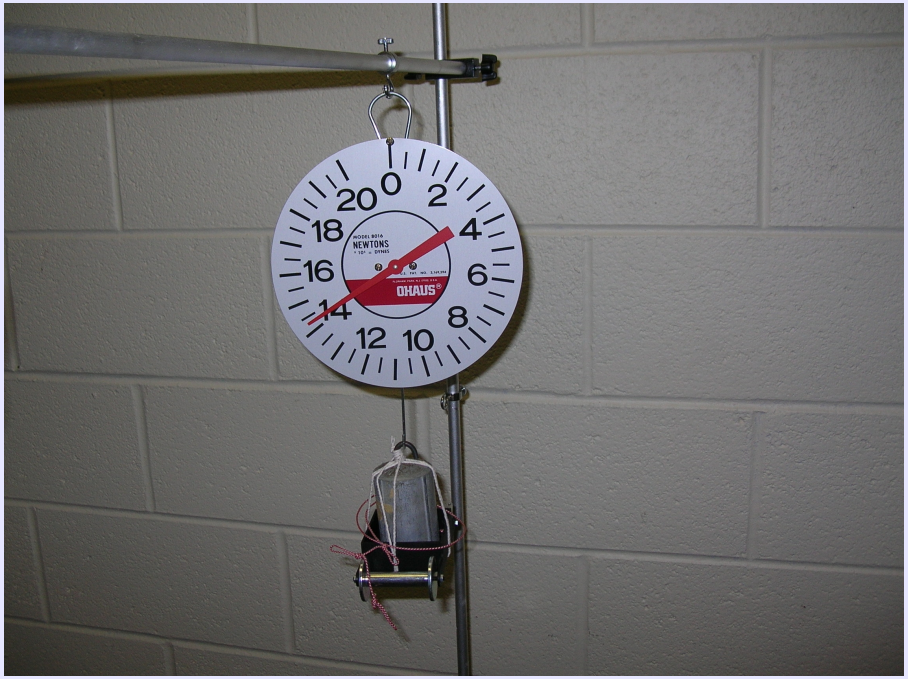


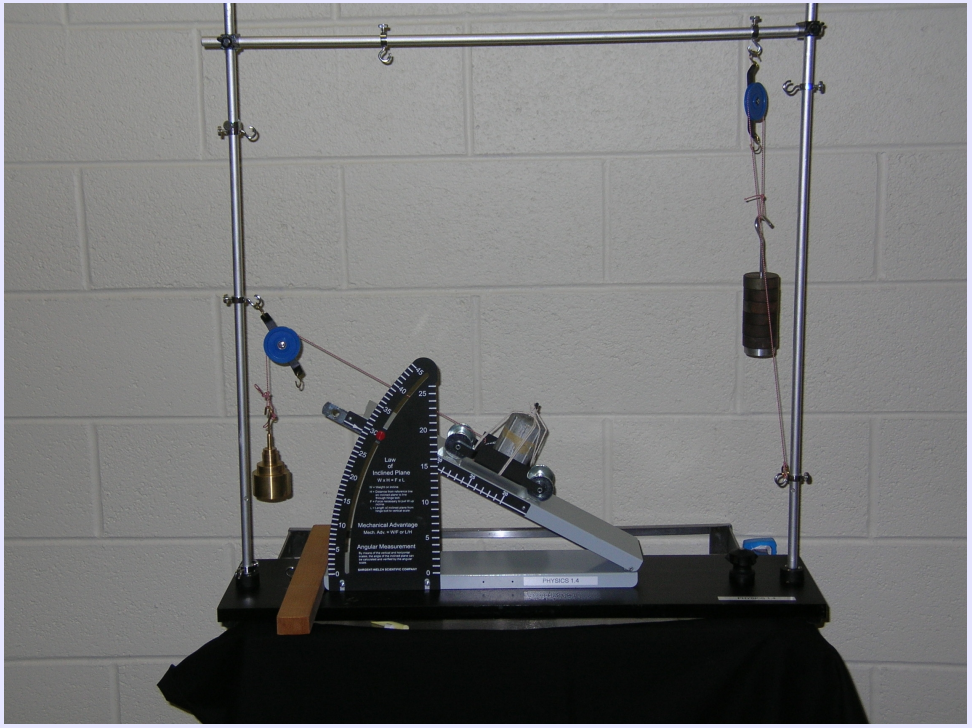






Credit goes to Dr. Haracz.





$$w \approx 14.25\ N$$

$$m \approx 1.45\ kg$$

$$F_T \approx 7.12\ N$$

$$M_1 \approx 0.72\ kg$$

$$F_N \approx 12.34\ N$$

$$M_2 \approx 1.26\ kg$$