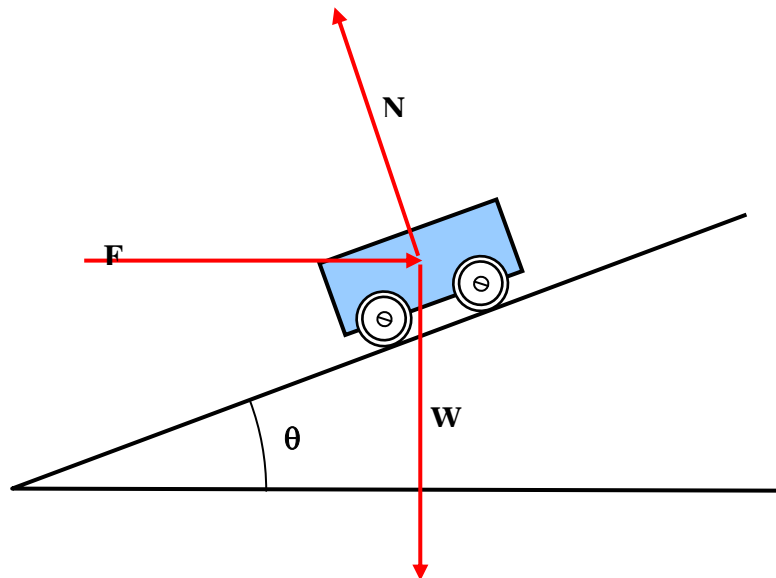


TAP 202- 3: A trolley on a slope

The diagram shows a frictionless trolley on a slope. The trolley is held stationary by the horizontal force F .



Explain why the horizontal component of the normal reaction must be equal in magnitude to the force F if the trolley is in equilibrium. Explain why this is also the case when the trolley is moving down the slope at constant velocity.

Find the horizontal component of N .

Explain why the vertical component of the normal reaction must be equal in magnitude to the weight W if the trolley is in equilibrium.

Find the vertical component of N .

(e) Combine your answers to (b) and (d) to show that $F = W \tan \theta$