SiQuENC: Newtonian dynamics for linear motion

Neatly and graphically represent situation(s)

Carefully read the problem three times.
Draw object(s) and relevant aspects of environment.
Identify requested unknowns.

Graphically represent quantities and their relationships

Free-body diagram

B – Use dashed **b**ubble to indicate object(s) in system.
E – Is the **E**arth nearby (right now)?
T – Is anything **t**ouching the system (right now)?
A – Draw **a**xes (indicate $+x$ and $+y$ directions), with a positive direction matching direction of system's acceleration. If there is no direction of acceleration, orient axes to minimize the number of forces that fail to point along a drawn axis.

Identify relevant allowed starting point (in)equation(s)
including Newton's laws (stated at bottom row)

	Force	F_x	F_y
1			
2			
3			
4			
5			
6			
7	$\sum$	ma_x (is $a_x = 0$?)	ma_y (is $a_y = 0$?)

Use numbered steps to show REASoNing

Communicate

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Example: Complete a force component chart for a block resting on a rough plane inclined at an angle of θ above the horizontal.

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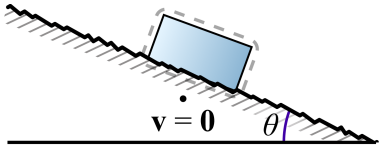
Identify requested unknowns.



?: Force component chart

Graphically represent quantities and their relationships

Free-body diagram

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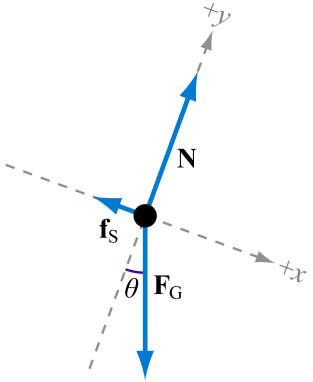

Identify relevant allowed starting point (in)equations
Including Newton's laws (stated at bottom row)

	Force	F_x	F_y
1	$\vec{\mathbf{F}}_\mathrm{G}$	$+F_\mathrm{G}\sin\theta$	$-F_\mathrm{G}\cos\theta$
2	$\vec{\mathbf{N}}$	0	$+N$
3	$\vec{\mathbf{f}}_\mathrm{S}$	$-f_\mathrm{S}$	0
4			
5			
6			
7	Σ	ma_x (is $a_x = 0$?)	ma_y (is $a_y = 0$?)

Use numbered steps to show REASoNing

Communicate