SCAN

Problem: _____ **Bubbled system:** _____ **Axes:** $+x$ **direction:** ____ $+y$ **direction:** ____

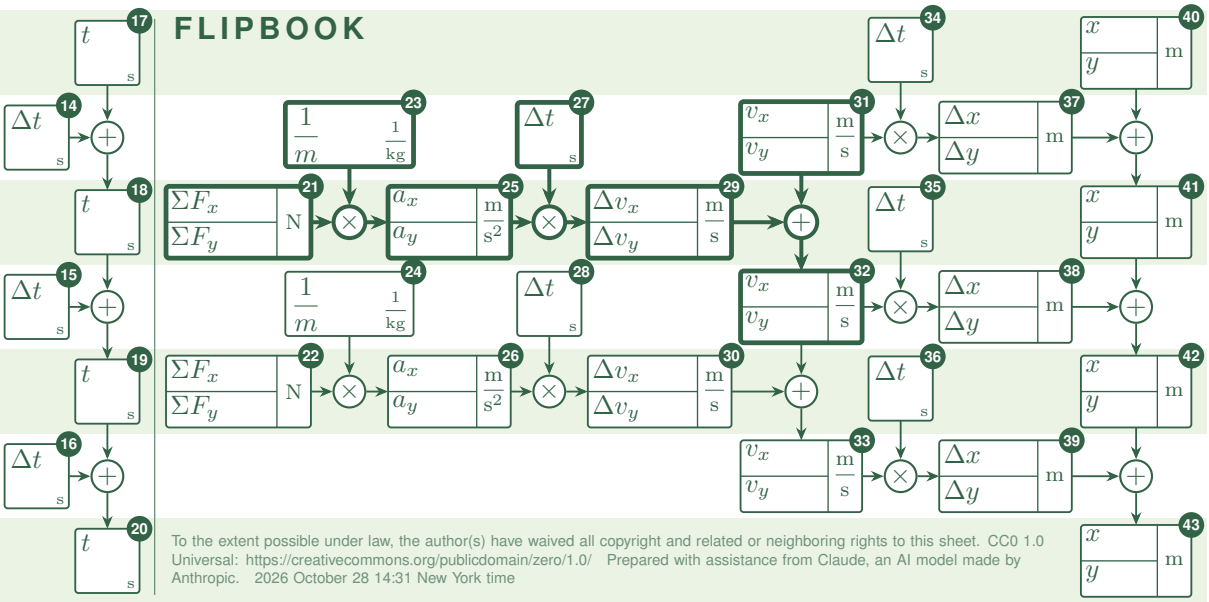
	Short phrase	Cartoon	Axes and plots	Notation
1				
2				
3				
4				
5				
6				
7				

FORCE LEDGER

One row per force on system. **A dot always represents the system.**

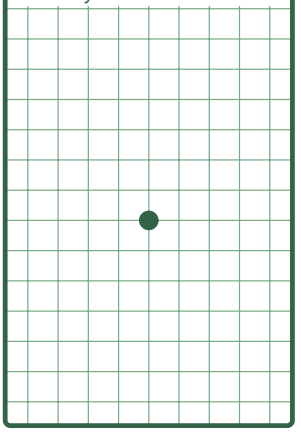
Culprit	Force	Direction of force on system			x-sign	x-mag (N)	y-sign	y-mag (N)
Not touching		**Earth's center**	**System dot**	**System → Center**				
Earth	8 $F_{\mathrm{G,E\,ON\,__}} = mg$				+ or −		+ or −	
Touching		**Relaxed**	**Deformed**	**Deformed → Relaxed**				
Rope: _____	9 $F_{\mathrm{T,__\,ON\,__}}$	*Relaxed rope*	*Stretched rope*		+ or −		+ or −	
Surface: _____	10 $F_{\mathrm{N,__\,ON\,__}}$	*Unindented face*	*Indented face*		+ or −		+ or −	
	11 *Choose one:* $f_{\mathrm{S,__\,ON\,__}} \le \mu_{\mathrm{S}} F_{\mathrm{N}}$ $f_{\mathrm{K,__\,ON\,__}} = \mu_{\mathrm{K}} F_{\mathrm{N}}$	*Relaxed bristle tip*	*Bent bristle tip*		+ or −		+ or −	
_____:	12 *Any other force:* $F_{_,\mathrm{__\,ON\,__}}$				+ or −		+ or −	
	13			**Net force** ΣF				

FLIPBOOK



FORCE DIAGRAM

one arrow per ledger row, tail on system dot



To the extent possible under law, the author(s) have waived all copyright and related or neighboring rights to this sheet. CC0 1.0 Universal: https://creativecommons.org/publicdomain/zero/1.0/ Prepared with assistance from Claude, an AI model made by Anthropic. 2026 October 28 14:31 New York time

DAVIDLIAO.COM