

Main topics: Newton's second law, vector decomposition, kinetic friction, static friction, free-body diagrams, vector addition, systems of equations

(Knight 4<sup>th</sup> Edition Problem 6.72)

You are given the following dynamics equations:

$$\begin{aligned}(100 \text{ N}) \cos 30^\circ - f_k &= (20 \text{ kg}) a_x \\ n + (100 \text{ N}) \sin 30^\circ - (20 \text{ kg}) (9.8 \text{ m/s}^2) &= 0 \\ f_k &= 0.20n\end{aligned}$$

- Write a realistic problem for which these are the correct equations
- Draw the free-body diagram and the pictorial representation for your problem
- Finish the solution of the problem. Answer: ( $a_x = 2.8 \text{ m/s}^2$ )