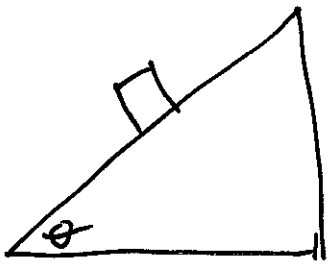
Block on a ramp, a flowchart



break the force of gravity into components → find magnitude of normal force → ~~find maxim~~

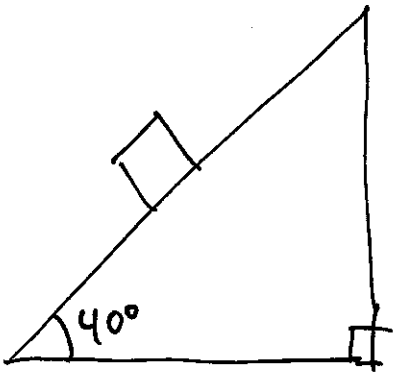
find maximum force of static friction → if the x-component of gravity is less than the maximum static friction →
- The box does not move
- frictional force = x-component of gravity

else

The box moves →
- frictional force is kinetic friction

$F_{frk} = \mu_k \cdot F_N$

- find net force and acceleration



An 8 kg box is on a ramp at an angle of 40°

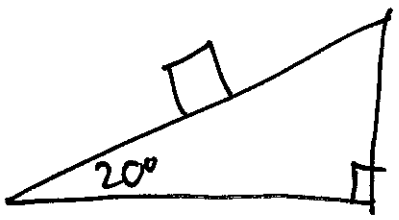
$\mu_s = 0.3$

$\mu_k = 0.2$

(a) - Determine if the box moves.

(b) - ~~Determine~~ Draw a quantitative free-body diagram of the block. ~~Then~~ Write the name of each force.

(c) - If the block moves, determine its acceleration. Otherwise, write $a = 0$.



A 12 kg box is on a ramp with an angle of 20°.

$\mu_s = 0.35$

$\mu_k = 0.2$

(a) Determine if the box moves.

(b) ~~Determine~~

Draw a quantitative free-body diagram of the box.

Write the name of each force.

(c) If the box moves, determine its acceleration.

Otherwise, write $a = 0$.