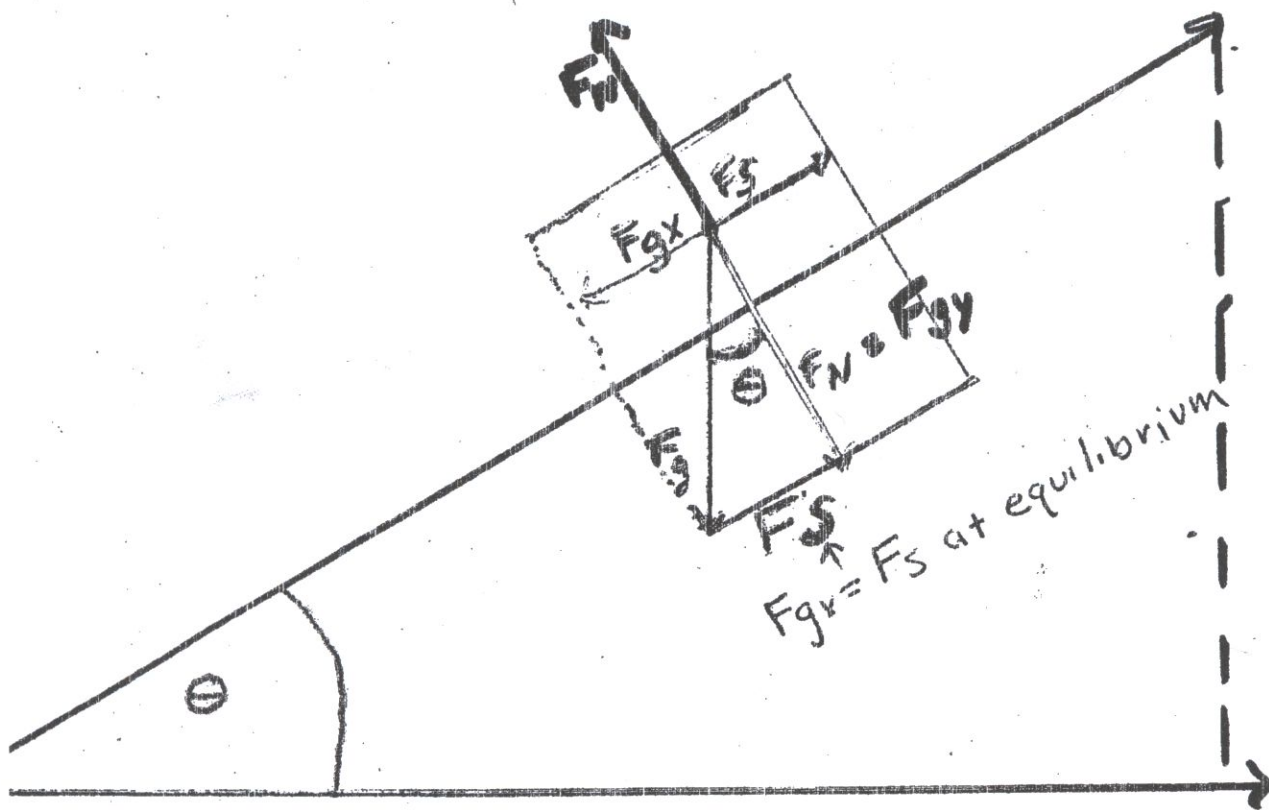


A NEW ANGLE ON FRICTION



$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{F_s}{F_N} = \mu$$

or

$$\theta = \frac{1}{\tan} * \frac{F_s}{F_N}$$

FORCE TABLE LAB

OBJECTIVES: The student will diagram and show calculations for a free-body diagram.

MATERIALS: force table
Paper and pencil
Gram scales

PROCEDURES:

1. Set the 3 spring scales at some angles selected by your group.
2. Check that the spring scales are freely moving.
3. Measure the angles and record the angles and forces for each scale.
 $F=ma$ or $N=kg \times 9.81 \text{ m/s}^2$.
4. Make a free-body diagram of the forces exerted on the central connection point of the scales.
5. Show your calculations to determine the x and y components.
6. Try to use your calculations to show that the force table is in equilibrium.
7. Make conclusions about your results.

DATA:

CONCLUSIONS:

A NEW ANGLE ON COEFFICIENT OF FRICTION LAB

OBJECTIVES: The student will calculate coefficient of static friction given an object and a ramp of known material and angle of slant.

MATERIALS: weight
Wooden or fiberboard ramp
protractor

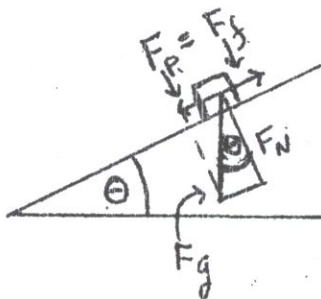
- PROCEDURES:**
1. Set up your ramp so that a you can change the angle without the ramp moving.
 2. Set your weight near the top of the ramp and start increasing the angle until the weight breaks free and slides down the ramp.
 3. Measure the angle between the ramp and the horizontal surface on which it rests.
 4. Repeat steps 1-3 to obtain data from 3 trials.
 5. Calculate your coefficient of static friction, using the following equation:

$$\tan \theta = \frac{F_f}{F_N} = \mu_s$$

6. Compare this value to the accepted value and calculate percent error.

DATA/CALCULATIONS:

CONCLUSIONS:

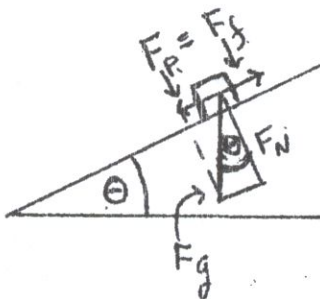


A NEW ANGLE ON COEFFICIENT OF FRICTION LAB

OBJECTIVES: The student will calculate coefficient of static friction given an object and a ramp of known material and angle of slant.

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Wooden or fiberboard ramp
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DATA/CALCULATIONS:

CONCLUSIONS: