Pre-Lab Practice: Motion on an Incline

Review the Textbook:

- PHYS 1401: Serway & Vuille: Chap 4, Examples 4.7 - 4.9.
- PHYS 2425: Serway & Jewett: Chap 5, Example 5.6.

A suitcase of 50.0 kg is pulled with a force of 900N at an angle of 10.0° above the horizontal over a frictionless surface.

1. What is the vertical component of the applied (pulling) force? (156 N)

2. What is the horizontal component of the applied force? (886 N)

3. What is the magnitude of the normal force exerted by the ground? (334 N)

4. A box slides down a frictionless slope of 25°. What is the acceleration of the box? (4.14 m/s²)

5. If you want a box to glide down a frictionless slope with an acceleration of 1 m/s², what should the slope be? (5.9°)

6. On a 2° frictionless slope, a box is observed to have an acceleration of 0.32 m/s². What is the experimental gravitational acceleration in this case? (9.2 m/s²)

7. A slope that is 0.64 meters long has one end 2cm above the other as shown in Figure 4. What is the angle of the slope? (1.8°)

![Figure 4. Ramp measurements used in determining the slope.](image)