Forces on an Incline Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When an object is on an incline and sliding down, we will try to determine how fast it will be sliding down the incline.

There are steps you must take to find out how fast the object is moving down the incline.

1.) Find the object’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ using Fw = mg

2.) Break down \_\_\_\_\_\_\_\_\_\_into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ components

3.) Angle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= Angle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ you made from Fw

4.) Use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find magnitude of the component vectors

Now that the object is on an incline, there are new things we need to remember….

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force is the same as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force.

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_force is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_force.

Example #1:

A 7kg box is resting on a frictionless surface at a 20ᴼ incline. Draw a free body diagram that shows all forces acting on the box.

Weight:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Perpendicular force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parallel force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Normal force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Acceleration:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example #2:

You and your bicycle (combined mass of 62kg) are at rest on a ramp of 37ᴼ.

Draw a free body diagram of all forces that are acting on you and the bicycle.

Weight:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Perpendicular force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parallel force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Normal force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Acceleration:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example #3:

The desk where you are sitting isn’t level and is slanting at a 5ᴼ angle. You place a 0.142 kg baseball on your desk and it begins to roll.

Draw a free body diagram showing all forces acting on the baseball.

Weight:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Perpendicular force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parallel force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Normal force:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Acceleration:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_