**Class Notes**

**How does adding mass affect friction?**

The greater the mass (or force pushing the surfaces together) the greater the friction.

**Why is friction greater between rougher surfaces?**

The rougher surfaces have a greater interaction between the microscopic “hills and valleys”. The bigger hills get caught in the deeper valleys.

**Explain the difference between static and kinetic friction.**

Static friction exists between two surfaces that are in contact but are not moving relative to each other. Kinetic friction exists between two surfaces that are in contact that are moving relative to each other. Rolling and sliding are both kinetic friction. Static is the greatest and rolling is the least of these forces.

**When is friction helpful and when is it harmful?**

It is helpful whenever we try to move.

It is harmful in that it causes machines and sneakers to wear out.

**Three ways to reduce friction:**

1. Lubricants 2. Make smooth

3. Make lighter or less force between objects 4. Add wheels

**Two ways to increase friction:**

1. Make rougher 2. Make heavier or more force between objects

3. **Complete these force vector diagrams:**

 5 N 11 N Net Force = 6 N (must have all 3)

 Subtract because the directions are opposite.

 6 N 8N Net Force = 14 N

 Add because the directions are the same.