FIRST ROBOTICS PHYSICS (FIRST RESQ)

**Problem statement:**

How much motor torque does it take to climb the top most mountain high zone; starting from a standstill at the base of that slope, slope has an angle of 51 degrees.

**Physical constants:**

3 sig fig

Robot Mass: 22.74 kg

Wheel radius(sprocket diameter) =1.22in=3.09cm=0.03 meters

Sin(51)= 0.777

**Problem solving:**

Torque=F\*radius

F=MA

F=kg \*m/sec2

F= 22.74kg\* (sin(51)\*9.8 m/sec2)=172.80 N

Torque=F\*radius

Torque= Newton\*meter

Torque= 172.80 N \* 0.03 meters= 5.16 N-m

Convert to Oz-in

1 N-m = 141.61Oz-in

141.61\*5.16=750.56 Oz-in + **overcoming friction force?**