ENAE 788X FALL 2012 PROBLEM SET 1

On Apollo 14, NASA provided the astronauts with the Modular Equipment Transporter, a two-wheeled cart which could be pulled by an astronaut walking on the moon. The wheels were 16 inches in diameter and 4 inches wide. The cart weighed 26 pounds, and carried 140 pounds of payload (Earth weights).

Calculate the force required by an astronaut to pull the MET with payload on the moon. List the contributions for all of the components of rolling resistance, assuming an internal rolling friction coefficient of 0.05. Produce a plot of total rolling resistance vs. slope, over a range of -20º to +20º.