

## Physics 10154 - Exam #8A

Answer the following two questions. Be sure to clearly indicate your answer with a circle or box. Show all work. If I cannot see how you arrived at an answer, I will deduct points!

1. A 7.0-meter long, uniform 320 Newton ladder rests against a smooth wall, making an angle with the ground of  $57^\circ$  above the horizontal. The coefficient of static friction between the ladder and the ground is 0.45. How far up the ladder can a 780 Newton worker climb before the ladder slips?

2. A 350-kg merry-go-round (treat it as a solid cylinder) starts at rest and is accelerated uniformly by a thin rope wrapped around the perimeter. The rope has a pulling tension of 220 Newtons and is tangent to the rim of the merry-go-round, which has a radius of 1.8 meters. There is a frictional torque of 160 N-m acting on the merry-go-round. After 5.0 seconds, what is the angular speed of the merry-go-round?