AP Physics 1 Name: _____

Unit 5&6 Quiz Date: _____

Directions: **Show the steps** required to arrive at the answer (if applicable).

1. A carousel, a horizontal rotating platform, of radius $\boldsymbol{r = 6.0\ m}$ is initially at rest, and then begins to accelerate constantly until it has reached an angular velocity ω=4 1/s after 8 complete revolutions. Determine:

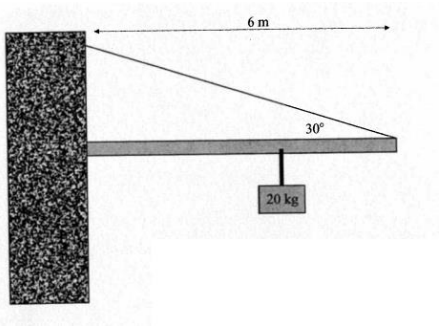
a) the angular acceleration of the carousel during this time?

b) the time required to accelerate the carousel

c) the moment of inertia of the carousel if a tangential force of magnitude F=200 is applied to rim of the carousel cause the acceleration.

2. A wheel is rolled down an incline. Will the incline travel faster if a) the wheel slides up the incline or b) the wheel rolls up the incline. Explain your answer.

3. A uniform rod of mass 12 kg and length 6 m is pivoted at one end to a wall and is partially supported by a guy wire attached at the end as shown. A 20-kg mass is suspended from a massless rope 4 m from the wall.



a) Determine the tension in the wire.

b) The acceleration of the rod ($I = 1/3ml^2$) if both strings are cut.