

## Physics 111 SI Session 1

- 1) You have tickets to the Blackhawks game in Chicago on October 5, so you book a round-trip airplane ticket that goes through Minneapolis. A week later, your friend decides they want to go with you, and can't get a plane ticket so they will drive straight there, then straight back. (assume you leave Ames and arrive in Chicago, then arrive back in Ames at the same time, due to your layover)
  - a) Who will have the greatest displacement?
  - b) Who will have the greatest average speed?
  - c) Who will have the greatest average velocity?
  
- 2) My friend Sally and I find a child stuck in a well. We run over, and I throw a rope up in the air, which falls into the well while Sally throws a rope down into the well at the same speed I throw my rope.
  - a) Do our ropes have the same velocity initially?
  - b) Which rope reaches the kid first?
  - c) Which rope hits the kid harder? (hint: the harder something hits somebody, the faster that something was going)
  - d) Who is smarter, me or Sally?
  
- 3) You're a bum trying to catch a train to the next town over. You see a train leaving the station 200 m in front of you. Trains typically accelerate around  $0.2 \text{ m/s}^2$ , and are restricted to 79 km/h in town. It takes you 2 seconds to reach your top speed of 5.6 m/s. Will you make it to the train? If so, how far do you have to run?
  
- 4) Groundbreaking research has found that eggs can withstand  $400 \text{ m/s}^2$  of acceleration before their shells break. How high do I have to drop my egg for my omelet if it takes the countertop 0.10 seconds to bring the egg to a stop?