

Part A

Consider the following flight. A plane leaves SLC and flies to Denver. The flight starts at time set to zero. It accelerates down the runway at 15 m/s^2 (about 1.5 g) for 10 sec . It then accelerates at 20 m/s^2 for 20 sec until it reaches flight speed. The distance to Denver is 450 miles flying at this constant speed. The plane decelerates and lands at Denver. On the return flight, assume the same acceleration and deceleration for takeoff and landing. However, on the return flight there is 40 mph headwind the entire flight.

- A) How fast is the plane traveling when it leaves the runway at SLC?
- B) How fast is it going once it reaches flight speed?
- C) How long does it take to get to the Denver airport?
- D) What is the average speed on the flight to Denver?
- E) What is the return airspeed?
- F) How long does it take to get from the Denver airport to the SLC airport?
- G) What is the average speed for the round trip flight? (Ignore any time waiting at the Denver airport.)
- H) What is the average speed for the flight from Denver to SLC?
- I) What is the average *speed* for the round trip flight? (Careful: this is a trick question!)
- J) Graph the distance, speed and acceleration versus time. You don't have to have equal spacing on the time axis, but clearly show the key times (For example, t_0 is start time, t_1 is time lifting off the SLC runway, etc.)

