## Week 1: Thursday

- Homework question/answer
- Motion in 1D:  $v_f^2 = v_i^2 + 2a\Delta x$
- More practice with constant acceleration
- Motion in 2d

A glider on a tilted air track is given a brief push uphill. The glider coasts up to near the top end, stops, and then slides back down. When the glider is at the highest point of its path, its acceleration is..



A: straight downB: downward along the trackC: upward along the trackD: no direction, the acceleration is zero.

If you drop an object in the absence of air resistance, it accelerates downward at 9.8 m/s<sup>2</sup>. If instead you throw it downward, its downward acceleration after release is

- 1. less than 9.8 m/s<sup>2</sup>.
- 2. 9.8 m/s<sup>2</sup>.
- 3. more than 9.8 m/s $^2$ .

A person standing at the edge of a cliff throws one ball straight up and another ball straight down at the same initial speed. Neglecting air resistance, the ball to hit the ground below the cliff with the greater speed is the one initially thrown

- 1. upward.
- 2. downward.
- 3. neither—they both hit at the same speed.

A marathon runner runs at a steady 15 km/hr. When the runner is 7.5 km from the finish, a bird begins flying from the runner to the finish at 30 km/hr. When the bird reach- es the finish line, it turns around and flies back to the runner, and then turns around again, repeating the back-and-forth trips until the runner reaches the finish line. How many kilometers does the bird travel?



30 km/h

If x is in meters, A is in m/s, and B is in m/s<sup>2</sup>, which of the following is dimensionally correct?

a) 
$$x = At - Bt^3$$
  
b)  $x = \frac{A}{t} - Bt$   
c)  $x = Bt^2 - At$   
d)  $x = At^2 + Bt$