Name: _____ *Honors Physics 2025-2026*

Bus Jump mini-lab

Introduction: Two-dimensional motion can be analyzed by considering the horizontal and the vertical components separately. The infamous "bus jump scene" from the movie *Speed* is one example.

Your task: Watch the bus jump scene and answer the questions below.

In this exercise, you MAY discuss your solutions and ideas with classmates. You may NOT share written work directly (e.g. "can I see your paper?"), and EACH STUDENT will submit THEIR OWN solution. This sheet with your solutions will be submitted before the end of class. Remember to show your work, and give units with your solutions.

You will be graded on your correct use of projectile concepts and equations, clearly shown work to support your solutions, and reasonable final answers. **This assignment is worth 10 points.**

Questions:

1. There is a gap in the freeway that the bus must jump. Convert the gap's width to meters (hint: 1 foot = 0.3048 m).

2. How fast is the bus traveling when it hits the gap? What is its velocity in m/s? (hint: 1 mi = 1609 m)

3. Keanu hopes that there is some "incline" that will assist them. Assume that the opposite side of the gap is 1 meter lower than the takeoff point. Also, the stunt drivers that launch this bus clearly have the assistance of a "takeoff ramp" from which the bus launches at an angle. Assume that the ramp is angled at 3.00° above the horizontal.

   a. On the reverse side of this page, draw a picture of the situation and include all known/unknown values and a coordinate axis.

   b. Then, prove whether or not the bus will make it to the opposite side.