**EvaluAIde Bonus Assignment**

**Instructions:**

* Answer all questions in detail. Show your work where appropriate.
* Your submission must be a single PDF file. You may type your solutions or handwrite and scan them.
* This assignment is for bonus credit and will help improve our grading tools—thank you for participating!
* Submit your PDF via the usual course submission portal by the posted deadline.

1. **Constant Acceleration (1D):**  
   A car starts from rest and accelerates uniformly at for 8 seconds.  
   a) What is its final velocity?  
   b) How far does it travel in this time?
2. **Free Fall:**  
   A ball is thrown straight upward with an initial speed of .  
   a) How long does it take to reach its highest point?  
   b) What is the maximum height it reaches?
3. **Projectile Motion (2D):**  
   A soccer ball is kicked from ground level at at a angle above the horizontal.  
   a) How long is the ball in the air?  
   b) How far does it travel horizontally before hitting the ground?
4. **Relative Velocity:**  
   A river flows east at . A boat heads north at relative to the water.  
   a) What is the boat’s speed relative to the ground?  
   b) At what angle (relative to north) does it move as seen from the shore?
5. **Kinematics Challenge:**  
   A stone is dropped from a high cliff. At the same instant, a second stone is thrown upward from the base of the cliff with a speed of .  
   a) At what height above the ground do the stones pass each other?  
   b) How much time after release does this occur?