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 2.5 m/s^2 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 12 m/s.
   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 18 m/s at a 30° 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 2 m/s. A boat heads north at 4 m/s 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 45 m high cliff. At the same instant, a second stone is thrown upward from the base of the cliff with a speed of 15 m/s.

a) At what height above the ground do the stones pass each other?

b) How much time after release does this occur?