**Solution Set: College Physics I – Kinematics (1D and 2D Motion)**

**1. Constant Acceleration (1D):**  
A car starts from rest and accelerates uniformly at for 8 seconds.  
a) Final velocity:

b) Distance traveled:

**2. Free Fall:**  
A ball is thrown straight upward with .  
a) Time to highest point:  
At the top, .

b) Maximum height:

**3. Projectile Motion (2D):**  
Kicked at at .  
a) Time in air:

b) Horizontal distance:

**4. Relative Velocity:**  
River east at , boat north at .  
a) Speed relative to ground:

b) Angle relative to north:  
 east of north.

**5. Kinematics Challenge:**  
Stone 1 dropped from ; stone 2 thrown up from ground at .  
Let be height above ground where they meet after seconds.

Stone 1:   
Stone 2:   
Set :

Height:  
 above ground.