Quiz 6   Calc 1   Due 10/5/2021

Each question is worth 5 points. Show good justification for full credit. Open book, open notes, feel free to collaborate with anyone, but try to make sure you understand what you turn in well.

1. a) A car is driving toward an intersection from the east at 40 mi/h, and a second car is driving north toward the intersection at 60 mi/h. At what rate are the cars approaching each other when the first car is 0.3 mi from the intersection and the second car is 0.2 mi from the intersection?

   b) What is the rate at which the distance between the cars is changing if the second car is driving away from the intersection instead?

2. a) A ladder 10 ft long leans against a vertical wall. If the top of the ladder slides down the wall at a rate of 1 ft/s, how fast is the bottom of the ladder sliding away from the wall when the bottom of the ladder is 6 ft from the wall?

   b) How fast is the bottom of the ladder sliding away from the wall when the bottom of the ladder is 9.9 ft from the wall?

3. A water tank is shaped like a cone with the point downward with height 4m and a base radius 2 m. Water is being pumped into the tank at a rate of 3 m³/min.
   a) How fast is the water level rising when the water is 1 m deep?

   b) How fast is the water level rising when the water is 3 m deep?