EXAM 1

Name: ___________________________ Student ID #: ___________________________

TA (circle one): Akiko Golda Josh Mahamadou Matt Victoria

A.  [20 pts.] Two cars, A and B, are traveling along State Street as shown on the position vs. time plot below. On this plot, 2100 South State is the origin and north is the positive x direction. In the blanks below, enter A, B, both or neither that best answer the question posed.

1. _______ A _______ Which car is traveling only in the northward direction for the time plotted?
2. _______ B _______ Which car is moving more rapidly at the initial instant.
3. _______ A _______  _______ B _______ Which car momentarily stops and reverses direction?
4. _______ A _______ _______ B _______ At the instant the two cars have the same velocity, which car is more north?
5. _______ B _______ Which car has the greater speed when the two cars pass each other the second time?
6. _______ B _______ Mark a point on the horizontal axis representing the instant one of the cars is momentarily at rest. Label the point P.
7. _______ A _______ _______ B _______ Below draw velocity vs. time and acceleration vs. time plots for each car. Make sure you label the cars on the graph.

B.  [10 pts.] Vector \( \vec{A} \) has a magnitude of 15.0 units and points due north. Vector \( \vec{B} \) has a magnitude of 6.0 units. Circle the correct item in the parentheses.

1. If \( \vec{B} \) points north, the vector \( \vec{A} + \vec{B} \) has a magnitude that is (greater than, less than, equal to) 15.0 units.
2. If \( \vec{B} \) points south, the vector \( \vec{A} + \vec{B} \) has a magnitude that is (greater than, less than, equal to) 15.0 units.
3. If \( \vec{B} \) points south, the vector \( \vec{A} - \vec{B} \) has a magnitude that is (greater than, less than, equal to) 15.0 units.
4. If \( \vec{B} \) points due east, the vector \( \vec{A} + \vec{B} \) has a magnitude that is (greater than, less than, equal to) 15.0 units.
5. If \( \vec{B} \) points due west, the vector \( \vec{A} - \vec{B} \) has a magnitude that is (south of west, east of north, west of north).