1. An object begins traveling from rest. It experiences a uniform acceleration of $\vec{a} = 3 \; ^m/_{s^2} \, \hat{x} + 4 \; ^m/_{s^2} \, \hat{y}$. After 7 seconds, what is the object's velocity?

2. Consider again the object in the previous problem. What is the object's displacement after the seven seconds of travel?

3. Consider again the object in the previous two problems. At the end of the seven second interval, the *x* component of the acceleration goes away. The object travels for an additional seven seconds. What are its velocity and displacement at the end of this time?

4. A cannon shoots a cannonball with an initial speed of 547 m/s oriented at an angle of 20° above the horizontal.

a) How high does the ball travel?

b) How long does it take to reach its maximum height?

c) How far does the ball travel horizontally?

5.   Consider again the situation in the previous problem. At the exact instant that the cannonball leaves the cannon, a rocket car begins accelerating along the ground traveling in the same direction as the horizontal component of the cannonball's initial velocity. The rocket car begins with a velocity of zero and a constant acceleration. What acceleration does the rocket car need to have so that it gets hit by the cannonball?