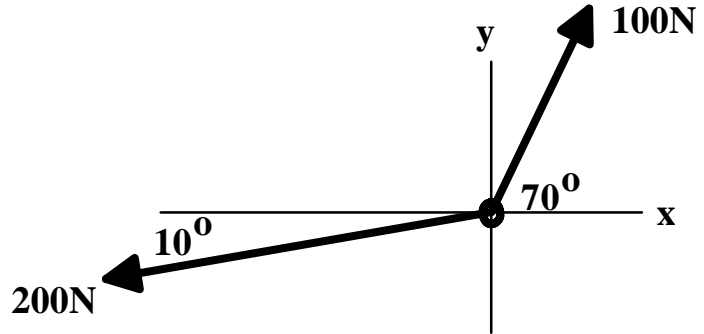


PHY 1350 EXAM #1 FALL 1994

To receive credit, you must show your work in full.

1. A ring on a force table is held in equilibrium by 3 forces, two of which are shown. What must the components of the third force be? (Use the method of components to solve for the unknown force.)



2. A motorcyclist rides away from a signpost with a velocity of 50.0 miles per hour due East. A car moves away from the same signpost in a direction 30.0° East of North. The car's speed is 20 miles per hour. What is the magnitude and direction of the velocity of the car as seen by the motorcyclist?

3. At time zero, car B is 315 meters **East** of car A and has a constant velocity of 20.0 m/s **West**. At this same time, car A is starting from rest but has an acceleration of 2.00 m/s/s **East**. Putting the origin at A's initial position, when and where do the two cars pass?

4. A rifle bullet whose muzzle speed is 405 m/s is fired at an angle of 30.0° above the horizontal.

(a.) Ignoring air friction, what is the height of the bullet above its starting position when it has traveled a horizontal distance of 860. m?

(b.) Where is the object when it has reached its maximum height?

5. The position of an object as a function of time is given by:

$$\vec{\mathbf{r}} = (20\frac{\text{m}}{\text{s}}\times t)\hat{\mathbf{i}} + (40\frac{\text{m}}{\text{s}}\times t)\hat{\mathbf{j}} - (5.0\frac{\text{m}}{\text{s}^2}\times t^2)\hat{\mathbf{i}}$$

What is the velocity of the object at $t = 3.0$ seconds?