Name: _____

PHYS 1210 Quiz 2

Standards 6–9

1. What is the same at all times for a ballistic trajectory? Select all that apply; there may be more than one, or there may be none.

   • velocity • direction of velocity • speed
   • acceleration • direction of acceleration • magnitude of acceleration
   • rate of change of speed

2. What is the same at all times for uniform circular motion? Select all that apply; there may be more than one, or there may be none.

   • velocity • direction of velocity • speed
   • acceleration • direction of acceleration • magnitude of acceleration
   • rate of change of speed

3. Evaluate the following operations with vectors.

   a. $(3.0\,\hat{\imath} + 4.0\,\hat{\jmath}) + (-4.0\,\hat{\imath} + 4.0\,\hat{\jmath}) =$

   b. $(2.0\text{ s})\left(5.0\frac{\text{m}}{\text{s}}\hat{\imath} + 1.0\frac{\text{m}}{\text{s}}\hat{\jmath}\right) =$

   c. $(3.0\text{ m}\,\hat{\imath} + 1.0\text{ m}\,\hat{\jmath}) \cdot (15.0\text{ N}\,\hat{\imath}) =$

   d. $(3.0\text{ m}\,\hat{\imath} + 3.0\text{ m}\,\hat{\jmath}) \times (-15.0\text{ N}\,\hat{\imath} + 15.0\text{ N}\,\hat{\jmath}) =$

   e. $\hat{\imath} \cdot \hat{\imath} =$

   f. $\hat{\jmath} \cdot \hat{k} =$

   e. $\hat{\imath} \times \hat{\imath} =$

   f. $\hat{\jmath} \times \hat{k} =$

4. A projectile launcher launches a steel ball from a lab table at a speed of 5.25 m/s and an angle of 50° above horizontal.

   a. How much time later does the ball return to its launch height?

b. How far away horizontally is the ball when it returns to its launch height?

c. What is the ball's speed when it returns to its launch height?

5. A bicyclist rounds a turn with a radius of 4.5 m at a speed of 11.0 m/s. What is the bicyclist's acceleration toward the center of the turn?

6. Two wooden horses are mounted on the platform of a merry-go-round at an amusement park. One is midway between the axis of the platform, and the other is near the edge. When the merry-go-round is turning, which wooden horse has the greater magnitude of acceleration: the one closer to the axis of rotation, or the one closest to the edge of the platform?