University of Alabama
Department of Physics and Astronomy

PH 105 LeClair Summer 2012

Quiz 2

1. A projectile is launched on level ground with a velocity of $\vec{v_i} = 3.00\,\hat{\imath} + 4.00\,\hat{\jmath}$ in units of m/s. What is the launch angle θ_i, relative to the x (or $\hat{\imath}$) axis?

- □ 53.1°
- □ 36.9°
- □ 45.0°
- □ 69.3°

2. How far in the x (or $\hat{\imath}$) direction does the projectile in question 1 travel before impact? Recall

$$h = y_{max} = \frac{{v_i}^2 \sin^2\theta_i}{2g} \qquad R = x_f - x_i = \frac{{v_i}^2 \sin 2\theta_i}{g}$$

- □ 0.816 m
- □ 1.57 m
- □ 2.45 m
- □ 0.882 m

3. A particle has a trajectory that follows $\vec{r} = (3.2\,\hat{\imath} + 1.5\,\hat{\jmath})t + \frac{1}{2}(4.9\,\hat{\imath} + 9.8\,\hat{\imath})t^2$, where t is in seconds, and r is in meters. What is the velocity in the y (or $\hat{\jmath}$) direction at $t = 17.2$ s? Note

$$\vec{v} = \frac{d\vec{r}}{dt} = \frac{dx}{dt}\,\hat{\imath} + \frac{dy}{dt}\,\hat{\jmath} = v_x\,\hat{\imath} + v_y\,\hat{\jmath}$$

- □ 258 m/s
- □ 137 m/s
- □ 312 m/s
- □ 170 m/s

4. How far has the particle in question 3 traveled *in the x or $\hat{\imath}$ direction* from $t = 0$ to $t = 17.2$ sec?

- □ 2250 m
- □ 780 m
- □ 1480 m
- □ 2920 m