Math 251, section 01
Quiz 3 September 14, 2016

Name:

By handing in this quiz you assert that you understand and have followed IIT's guidelines for academic integrity.

(1) Let C be the curve that is the intersection of the surfaces $z = x^2 + y^2$ and $z = 4y + 5$. Sketch C. Find a parametrization of C.
(Hint for the parametrization: eliminate z first, then choose x and y, then find z.)

(2) Consider the vector function $\mathbf{r}(t) = \langle t\cos t,\ t,\ t\sin t\rangle$.
(a) Find $\mathbf{r}'(t)$.

(b) Find an equation for the tangent line to $\mathbf{r}$ at $t = \pi/2$.

(c) Set up, but do not evaluate, an integral that gives the arc length of $\mathbf{r}(t)$ from $t = 0$ to $t = \pi$. (Your final answer should not involve any vectors, only a Calc1&2 integral.)