MATH 11: MULTIVARIABLE CALCULUS FALL 2018 HOMEWORK #2

Please turn in your completed homework assignment by leaving it in the boxes labeled "Math 11" in the hallway outside of Kemeny 105 anytime before 3:30 p.m. on Wednesday, September 26.

Problem 1.

(a) Find a vector function $\mathbf{r}(t) = \langle x(t), y(t), z(t) \rangle$ that represents the curve of intersection of the two surfaces

$$x^2 + y^2 = 1$$
 and $z = x^2$.

- (b) Sketch the two surfaces and the curve.
- (c) Find parametric equations for the tangent line to the curve at the point (0, 1, 0).

Problem 2. A Blue Angels pilot is at position (0, 0, 3) at time t = 0 and starts flying in a spiral trajectory given by $\mathbf{r}(t) = \langle 3 \sin t, 4t, 3 \cos t \rangle$. Where is the pilot after he's flown 10 units of arc length along this trajectory? What are his velocity and speed at that point?

Date: Due Wednesday, September 26, 3:30 p.m.