Name: _____

Math 253 Calculus III (Bueler) Wednesday 7 February 2018

Quiz #3

In class. 25 minutes. No textbook or notes or calculator. 30 points total.

1. (*6 pts*) Find an equation of the plane through the point $(5, 3, 5)$ and with normal vector $2\mathbf{i} + \mathbf{j} - \mathbf{k}$. Write your answer in the form "$ax + by + cz + d = 0$."

2. (*6 pts*) Use traces to sketch and identify the surface:

$$x^2 + 4y^2 + 9z^2 = 1$$

3. (*6 pts*) Find the point at which the line intersects the given plane:

$$x = 2 - 2t, \quad y = 3t, \quad z = 1 + t; \qquad\qquad x + 2y - z = 7$$

(*Hint: Make sure to find the* point*, not just a parameter value.*)

4. (*6 pts*) Find the angle between the planes:

$$5x + 2y + z = 2, \qquad y = 4x - 6z$$

(*Hint: A concrete expression for the answer is fine. I know you do not have a calculator.*)

5. (*6 pts*) Find a vector equation for the line segment that joins $P(a, b, c)$ to $Q(u, v, w)$.
(*Hint: The parameter is in what interval?*)