Quiz #2 for Calculus 3 (MATH-UA.0123-001)
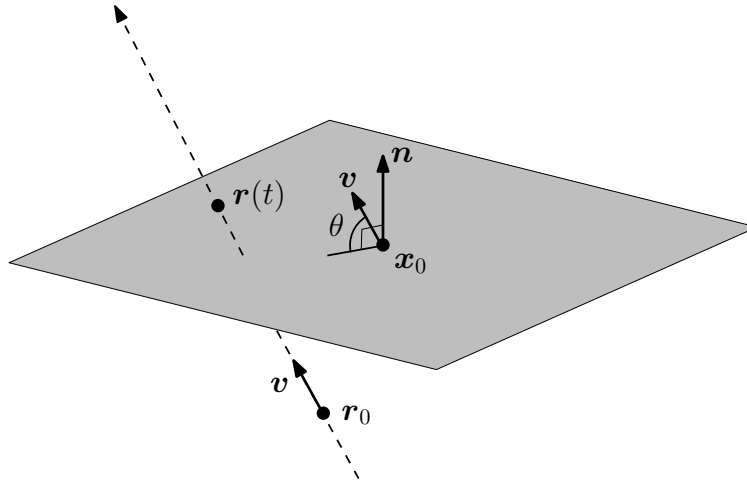
In the following problems, let $r(t) = r_0 + tv$ be the equation for a parametric line, and let $n \cdot (x - x_0) = 0$ be the equation for a plane. *Important! Assume that $v \cdot n > 0$.*

Problem 1. Write an expression for a point that lies on *both* the line and the plane. Solve for the value of t parametrizing this point. [*3 points*]

Problem 2. Under what conditions do the line and plane intersect? [*2 points*]

Problem 3. Write an expression for the angle θ, as shown in the figure. [*3 points*]

Problem 4. Write the general expression for a quadric surface. [*2 points*]