Calculus III: Midterm II Review

Vector functions and 3D curves

1. Identifying simple functions and the curves they trace.
2. Finding surfaces containing the curve.
3. Parametrizing intersections of surfaces.

Arc length and curvature

1. Finding the distance travelled s by calculating the speed.
2. Reparametrizing the curve by s instead of t.
3. Calculating curvature.

TNB frame

1. Finding the unit tangent, normal and binormal vectors.
2. Understanding what T, N and B represent.
3. Finding the normal and osculating planes.
4. Finding the equations for the tangent line.

Applications

1. Position, velocity, acceleration (going back and forth).
2. Newton's second law, ~~Kepler's laws~~.
3. Tangential and normal components of acceleration.

Functions of several variables

1. Domain of a function.
2. Graph of a function.