• Stuff I’m assuming from last quarter:
  – an understanding of vectors (especially in $\mathbb{R}^2$ and $\mathbb{R}^3$)
  – dot products and cross products
  – equations of lines in $\mathbb{R}^3$
  – equations of planes
  – limits and derivatives of vector functions

• You should have an understanding of vector functions, including:
  – tangent vectors and tangent lines
  – principal normal and binormal vectors
  – the osculating plane
  – computing the length of a curve
  – curvature (definition and computational formula)

• You should have an understanding of multi-variable functions, including:
  – level curves and level surfaces
  – partial derivatives (first- and second-order)
  – limits
  – continuity
  – differentiability
  – gradient (computation and significance)
  – directional derivatives
  – MVT and its corollaries
  – chain rule for $f \circ r$
  – tangent and normal lines to a curve $f(x, y) = c$
  – tangent planes and normal lines to a surface $f(x, y, z) = c$
  – local optima of $f(x, y)$ (including the second derivative test)
  – global optima of $f(x, y)$ on a closed, bounded set
  – Lagrange multiplier method

• One miscellaneous thing:
  – open and closed sets