DIFFERENTIAL GEOMETRY END SEMESTER

(1) Show that the tangent bundle of even dimensional real projective space is not trivial.

(2) Calculate the Gaussian curvature of the surface embedded in $\mathbb{R}^3$ obtained by revolving the circle $(x-2)^2 + y^2 = 1$ around the z-axis at points $(1,0)$ and $(3,0)$. (Here the metric on the surface is assumed to be the induced metric from $\mathbb{R}^3$.

(3) Show that there is no metric on S^2 having curvature bounded above by 0 and no metric on surface of genus g which is bounded below by 0.