

Homework I

1. Section 12.5 #40
2. Section 14.3 #78
3. Consider the function $f(x, y) = \sqrt{16 - x^2 - 16y^2}$.
 - (a) Sketch the domain of f .
 - (b) Sketch a contour map of f .
 - (c) Sketch the graph of f .
4. Section 14.4 #6.
5. (Adapted from Section 14.5 # 22) Let $T : \mathbb{R}^2 \rightarrow \mathbb{R}$ be given by $T(u, v) = \frac{v}{2u+v}$ and let $g : \mathbb{R}^3 \rightarrow \mathbb{R}^2$ be given by $g(p, q, r) = (pq\sqrt{r}, p\sqrt{qr})$.
 - (a) Use the matrix version of the Chain Rule to calculate $(T \circ g)'(2, 1, 4)$.
 - (b) Using your answer to part (a), determine $\frac{\partial T}{\partial p}$, $\frac{\partial T}{\partial q}$, and $\frac{\partial T}{\partial r}$ at the point $(2, 1, 4)$.
6. Section 14.6 #32.