

Supplementary Exercises for Section 11.1

1. Prove the Triangle Inequality for the standard Euclidean distance in \mathbb{R}^2 , using either algebra (messy) or the law of cosines (less messy).
2. What is the equation of the sphere with center $(3, -2, 1)$ and that goes through the point $(4, 2, 5)$?
3. Consider the sphere of radius 5 centered at $(2,3,4)$. What is the intersection of this sphere with each of the coordinate planes?
4. Is it possible for a plane to intersect a sphere in exactly two points? Exactly one point? Explain.