Math 140 Worksheet 11
Week 11: Optimization

Instructions. Write clear solutions on your own paper. Show enough work to justify your answers. Upload a single PDF of your work to Canvas.

1. Find the dimensions of the isoceles triangle of maximum area with perimeter 30.

2. Find the rectangle of maximum area that can be inscribed in a equilateral triangle with side length 15.

3. A right circular cone has height 10 and radius 6. Find the dimensions of the right circular cylinder of maximum volume that can be inscribed in the cone.

4. Find the point on the curve $y = \sqrt{x}$ that is closest to the point $(4, 0)$.

5. An offshore oil well is located 2 km from the closest point on a straight shoreline. A refinery is located 10 km along the shore from that point. The pipeline costs $1000000/km$ underwater and $500000/km$ on land. Where should the underwater pipeline intersect the shoreline to minimize total cost?