Ex1: A 10 – m – wide east – west canal flows into 15 – m – wide north – south. Find the length of the longest piece of wood with negligible width that can make the turn.

Ex2: Calculate the dimensions of the cylinder of largest volume that can be inscribed in a cone with height 8 m and base radius 5 m.

Ex3: Find the volume of the largest right circular cone that can be inscribed in a sphere of radius 3.

Ex4: What are the dimensions of the rectangle of largest area that can be inscribed in the triangle with vertices $(0,0)$, $(10,0)$, *and* $(0,5)$? Assume that one vertext of the rectangle is at the origin and the opposite vertex is on the line joining $(10,0)$ *and* $(0,5)$

Ex5: Find the point of the curve $y = x^2$ that is closest to $(4,-1/2)$

Ex6: When a theater owner charges $13 for admission there is an average attendance of 500 people. For every $2.0 increase in admission, there is a loss of 40 customers from the average. What admission should be charged to maximize revenue?