OPTIMIZATION PROBLEMS

5. A wire of length 12 inches can be bent into a circle, a square, or cut to make both a circle and a square. How much wire should be used for the circle if the total area enclosed by the figure(s) is to be a minimum? A maximum?

\[\text{circle} \quad \text{square}\]

6. A window consisting of a rectangular topped by a semicircle is to have a perimeter \(P\). Find the radius of the semicircle if the area of the window is to be a maximum.

7. A rectangular field as shown is to be bounded by a fence. Find the dimensions of the field with maximum area that can be enclosed with 1000 feet of fencing.