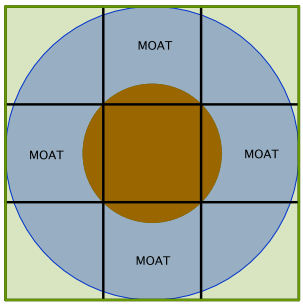
Problem of the Week

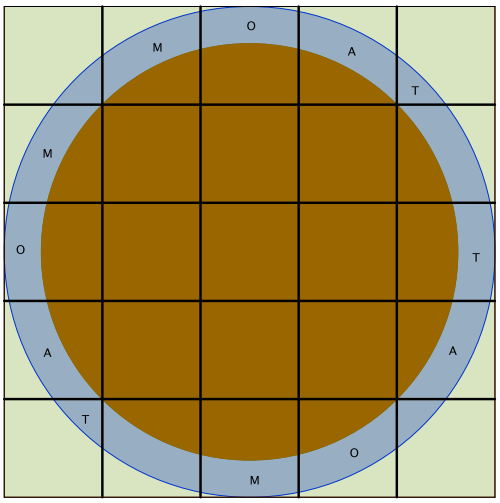
Problem D

Moats for Boats

A municipality has the opportunity to upgrade one of two square parks by building a circular moat for paddle boats in one of them. The surface of the moat is the area outside of a smaller circle and inside a second larger concentric circle. (From above, the moat looks somewhat like a donut.) West Park is 300 m by 300 m and East Park is 500 m by 500 m. Both parks are divided by horizontal and vertical grid lines spaced 100 m apart, as shown, creating nine and twenty five equal squares, respectively.



WEST PARK



EAST PARK

Both moat designs shown are based on municipal park rules:

- the outer edge of the moat must touch the midpoint of each of the four outer sides of the park; and
- the inner edge of the moat must pass through the four corners of the largest square totally inside the park created by the grid lines.

The city is interested in conserving water and will choose the plan which uses less water. Assuming that both moats will have an equal and constant depth, which Park will be chosen for the moat?