Homework #2

Due May 1, 2007

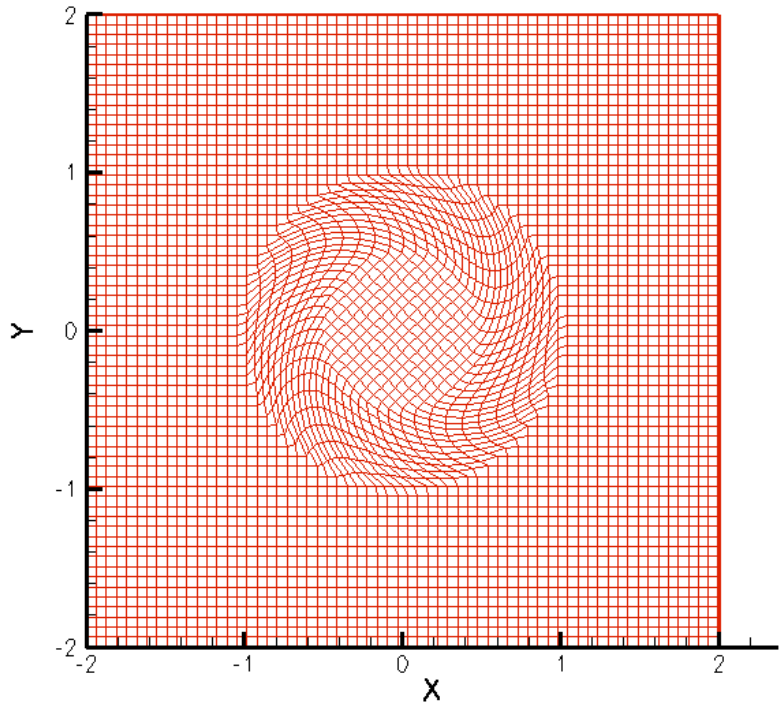
Generate a 2D mesh in a 4x4 square

The mesh is Cartesian but with a rotated subdomain (angle is 45 degrees)

Choose grid dimensions and the size of the inner circle as you wish

Part 1: Generate the grid using a suitable transformation (see next page) and then import it in gambit

Part 2: Generate the grid directly in gambit and discuss the difficulties (try to make it look like the preious one!)



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This functions transform ξ and η defined on a 2x2 square in the grid nodes reported in the previous page ($\theta = 45$deg)

$$x = \xi cos(\theta\alpha) + \eta sin(\theta\alpha)$$

$$y = \eta cos(\theta\alpha) - \xi sin(\theta\alpha)$$

where

$$r = \sqrt{(\xi^2 + \eta^2)}$$

$$\alpha = 0 \qquad \text{if r} > 1$$

$$\alpha = min(1, 2(1 - r)) \qquad \text{if r} < 1$$