

Problem  
**241**

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(Diagram not drawn to scale)

Given right triangles ABE and ACD, where every point on arc EC is equidistant from point A,  $AE = r$  and angle  $DAC = \theta$  (this is the same diagram as in problem 237):

1. For what angle  $\theta$  is the area of triangle ABE a maximum?
2. What is the maximum area of triangle ABE in terms of  $r$ ?

