10 Cutting Christmas Cookies

Authors: Pim van 't Hof, Stefano Piceghello (University of Twente)
Project: 4TU.AMI

Challenge

Pixies Pi and Pie are baking perfectly round Christmas cookies. Using a circular cookie cutter, they cut out four identical cookies from a large circular piece of dough. Figure 1 shows the piece of dough that remains after the cookies have been put in the oven. The figure also shows two perpendicular diameters AB and CD of the large circle. Diameter AB is tangent to the boundary of one of the circular holes. Line segment EF is a chord of the large circle that is tangent to the boundary of the same hole and parallel to diameter AB. The length of EF is 36 cm.

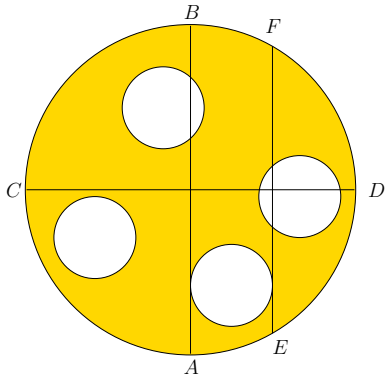

Figure 1: The remaining piece of dough.

What is the area of the remaining piece of dough?

Possible answers:

1. 244π cm^2
2. 300π cm^2
3. 312π cm^2
4. 320π cm^2
5. 324π cm^2
6. 344π cm^2
7. 360π cm^2
8. 368π cm^2
9. 381π cm^2
10. There is not enough information in the problem statement to compute the area of the remaining piece of dough.