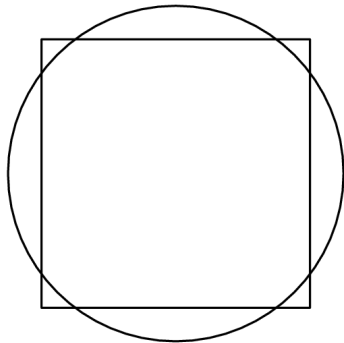
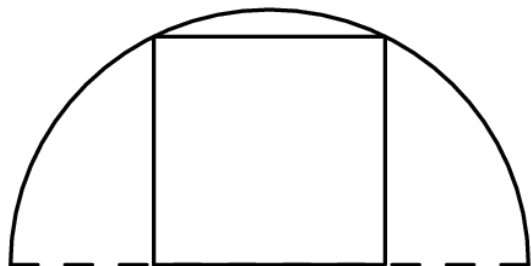


Denver Math Club
November 2018 Meeting
Geometry/Combinatorics Handout

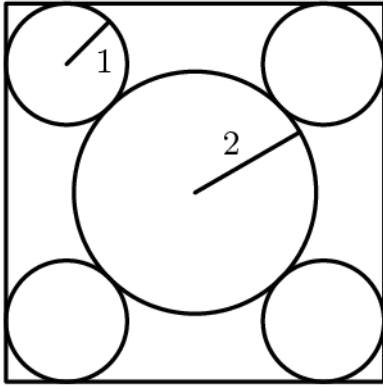
1. A circle and two distinct lines are drawn on a sheet of paper. What is the largest possible number of points of intersection of these figures?
2. How many committees of 3 people can be formed from a group of 12 people?
3. A circular table has 60 chairs around it. There are N people seated at this table in such a way that the next person seated must sit next to someone. What is the smallest possible value for N ?
4. A square with side length 2 and a circle share the same center. The total area of the regions that are inside the circle and outside the square is equal to the total area of the regions that are outside the circle and inside the square. What is the radius of the circle?



5. How many whole numbers from 1 through 46 are divisible by either 3 or 5 or both?
6. How many four-digit positive integers have at least one digit that is a 2 or a 3?
7. A square of area 40 is inscribed in a semicircle as shown. What is the area of the semicircle?



8. How many three-digit numbers satisfy the property that the middle digit is the average of the first and the last digits?
9. Four circles of radius 1 are each tangent to two sides of a square and externally tangent to a circle of radius 2 , as shown. What is the area of the square?



10. Consider the 12-sided polygon $ABCDEFGHIJKL$, as shown. Each of its sides has length 4 , and each two consecutive sides form a right angle. Suppose that \overline{AG} and \overline{CH} meet at M . What is the area of quadrilateral $ABCM$?

