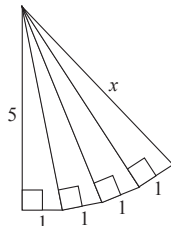
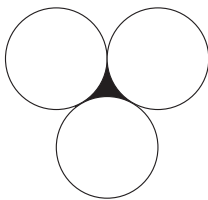


GEOMETRY TEST
STANFORD MATH TOURNAMENT
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1. In the figure below, what is the length of x ?

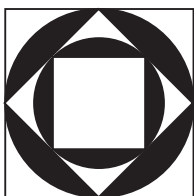
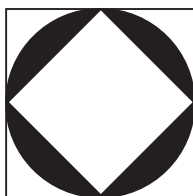


2. Upon cutting a certain rectangle in half, you obtain two rectangles that are scaled down versions of the original. What is the ratio of the longer side length to the shorter side length?
3. An equilateral triangle has sides 1 inch long. An ant walks around the triangle maintaining a distance of 1 inch from the triangle at all times. How far does the ant walk?
4. Given that the circles below each have radius 1 and are pairwise tangent, what is the area of the shaded region?



5. A lattice point is a point on the coordinate plane with integer values for x and y . How many lattice points lie on a circle centered at the origin with radius 25?
6. A kite is a quadrilateral with sides of length a , a , b , and b , where the sides of length a are adjacent, as are the sides of length b . If such a kite can be inscribed in a circle, then what is its area?
7. Consider a regular n -gon with side length s . What is the ratio of the area to the square of the perimeter in terms of n and s ? (expressed in fraction form)
8. Four regular triangular pyramids are in a line. The first three have side lengths of 3, 4, and 5, and the volume of the last pyramid is the sum of the volumes of the first three. What is the side length of the last pyramid?
9. A ladder of height h leans against a wall. It starts out flat against the wall, and then the base slides out along the ground until the ladder lies flat. The ladder touches the wall throughout this motion. What is the area underneath the path traced by the midpoint of the ladder?

10. In the diagrams below, each circle is inscribed in the surrounding square, and each square is inscribed in the surrounding circle. Suppose the pattern continues on to infinity. If the outermost square has side length 1, what will the area of the shaded region be?



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