2015-2016 JAMAC Individual Geometry Test
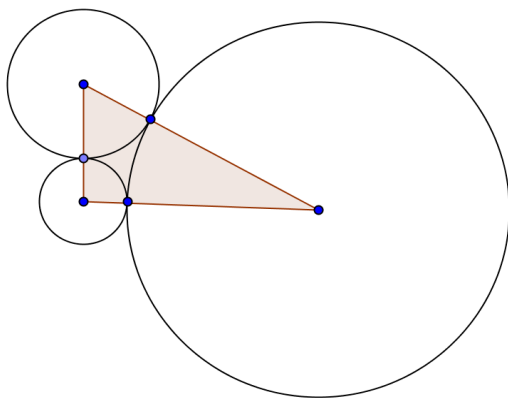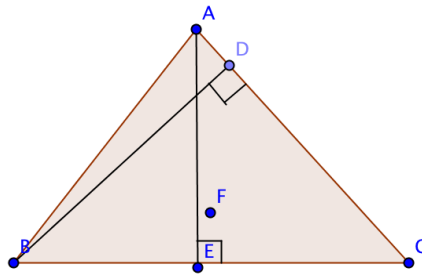
1. Rectangle $ABCD$ has side lengths of $AB = 3$ and $BC = 4$. What is the length of AC?

2. Circle O has a radius of 12. What is the ratio of the circle's circumference to its area?

3. Each side of a regular hexagon has a measure of 4 units. What is the area of this hexagon?

4. Square $ABCD$ is inscribed inside of a circle with radius 2. What is the area of the square?

5. A circular pizza was cut into 18 congruent slices, as shown. If 5 slices were eaten, what is the sum of the central angles of the slices that were not eaten?

6. Circles $W, O,$ and C are all tangent to one another. Circle W has a radius of $\frac{5}{2}$, circle O has a radius of 2, and circle C has a radius of $\frac{3}{2}$. What is the radius of the incircle of triangle WOC equal to?

7. Triangle ABC has perpendiculars drawn from vertices B and A. Let the base of these perpendiculars be called D and E, respectively. If angle DEA has a measure of 23 degrees, what is the ratio of angle ABD to angle AFD in degrees if point F is the circumcenter of the triangle.

8. Circles A and C each have radii of 3 and 6 respectively, and the distance from A to the closest point on circle C is equal to 1. Circle B is externally tangent to both circles A and C, and has a radius of 5. Let X be a point that lies on the circumcircle of triangle ABC with CX = 7 and BX = 9. Find the length of AX.