All answers must be exact and *NOT* decimal approximation. Radicals should be rationalized and expressed in simplest radical form, and fractions should be expressed in lowest terms. Label answers with correct units where appropriate.

1. _____ Determine the sum of the interior angles of a regular octagon (or 8-gon) in degrees.

2. _____ Find the length of the side of an square that is inscribed inside a circle of radius 2.

3. _____ What is the measure of a vertex angle of a regular pentagon?

4. _____ An isosceles trapezoid has a perimeter of 16 in, the length of the bases are 4 in and 8 in respectively. Find the length of the non-parallel side.

5. _____ Determine the area of a sector intercepted by a central angle of $60°$ in a circle of radius $r = 5$ cm.

6. _____ Find the area of an isosceles triangle that is circumscribed outside a circle of radius 4cm.

7. _____ A circle has a diameter of 14 cm. What is the perpendicular distance from the center of the circle to a chord of the circle that has length 12.

8. _____ A square inscribed in a circle has side 10 in. What is the length of the radius of the circle?

9. _____ Find the center and the radius of the circle $3x^2 - 6x + 3y^2 + 6y = 1$.

10. _____ Find the circumference of a circular disk whose area is 200 square centimeters.

11. _____ In a circle with center O, two chords AC and BD intersects at a point P inside the circle. Arc AB subtends an angle of $78°$ at O and arc CD subtends an angle of $149°$ at O. What is the measure of angle APB?

12. _____ The lengths of the diagonals of two similar rectangles are in the ratio $1 : 3$. What is the ratio of their areas?

13. _____ AB and CD are chords of a circle with center O that intersect at a point P inside the circle. If the lengths $AP = BP$, $CP = 17$, and $DP = 12$. Calculate the value of AP.

14. _____ Triangle ABC is right-angled at A, and AD is the altitude from A to the hypotenuse BC. If the lengths $AD = 4$, $DC = 6$, find the length of BD.

15. _____ The total length of the edges of an hexagon is 180 cm. What is its surface area?

16. _____ The vertices of the inscribed (inside) square bisect the sides of the second (outside) square. Find the ratio of the perimeter of the outside square to the perimeter of the inscribed square.

17. _____ Find the dimensions of the rectangle that has a length 6 meters more that its width and a perimeter equal in value to its area?