Name _____ Hour _____

FOUR'S COMPANY WITH ENGINE VALVES LAB

Read the attached article about the number of engine valves per cylinder in a car. You are going to verify what Tom and Ray had to say about the area covered by two circles (valves) versus the area covered by four circles (valves).

PART 1: Assume that the diameter of the largest circle is 100 cm. Find the area of the two smaller circles and the area outside these two smaller circles.
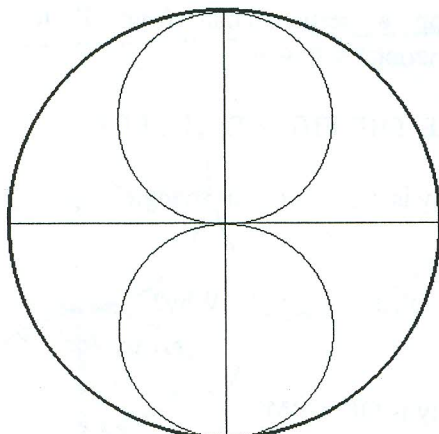
1.   Area of larger circle is _____ $d = 100\,cm \quad r = 50\,cm.$

$$A_0 = \pi r^2 =$$

2.   Area of two smaller circles is _____

$d = 50\,cm$
$r = 25\,cm.$

3.   Area outside two smaller circles is _____ *(waste)*

Area of big circle – area of smaller circles =

4.   The percent of area in the larger circle that is outside the two smaller circles is _____.

$$\% = \frac{Part}{whole} = \frac{Waste}{big\ circle\ area} =$$

PART 2: This part of the problem is somewhat harder than the first part. Again, assume that the diameter of the largest circle is 100 cm. Also, assume that the four smaller circles are tangent to the horizontal and vertical segments and to the larger circle.
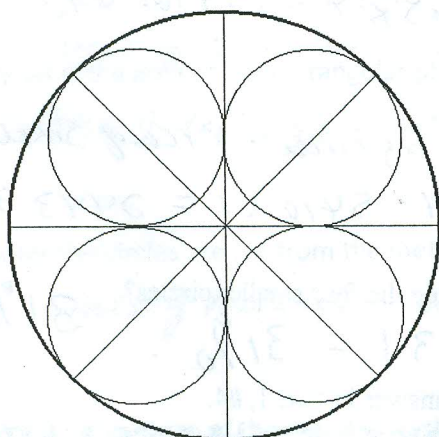
Find the area of the four smaller circles and the area outside these four smaller circles.

Let's focus our attention on finding the area of the smaller circle in the upper-right quadrant of the drawing.

1.   Label the center **O**.

2.   Label the point of tangency between the smaller and larger circle **T**.