1. Calculate the vertical distance from the horizontal line to the center of the small circle. The small circle is tangent to the three circular arcs. The circular arcs all have the same radius, $a$, and all have their centers on the horizontal line (or an extension of it).
2. Two small circles with the same diameters are tangent to each other, the large semicircle shown and the baseline. The center of the semicircle is on the baseline. Calculate the vertical distance from the baseline to the center of one of the small circles in terms of the radius of the semicircle, a. (10 points)