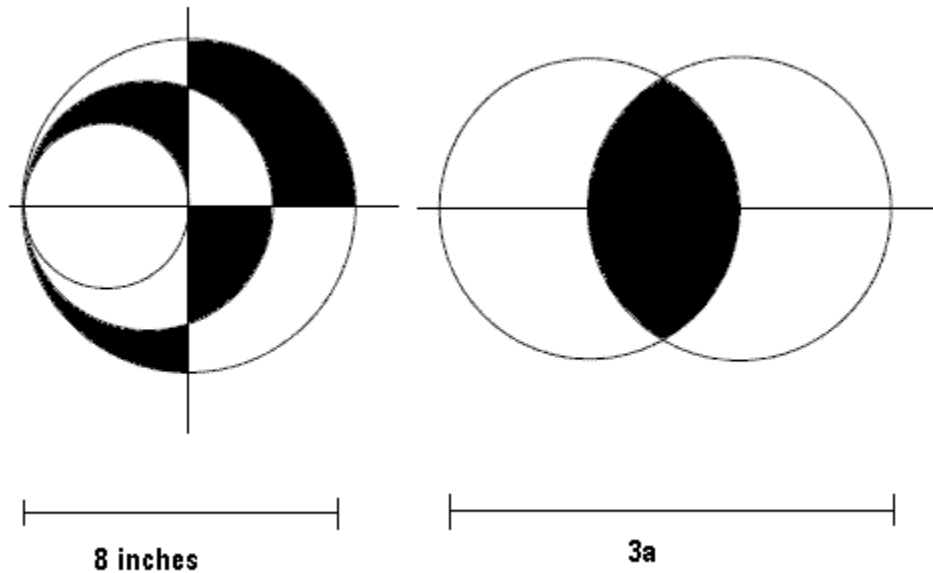


Circular Reasoning (problem submitted by Jeff Cathrall)



In the figure on the left, the large circle has diameter 8 and the smallest circle has diameter 4 and is internally tangent to the large circle. The medium size circle is tangent to both of the circles at their point of tangency. In the figure on the right the “lune” is formed from two circles which pass through each other's center.

Find the value of a so that the shaded regions of each figure have the same area. Show all work.