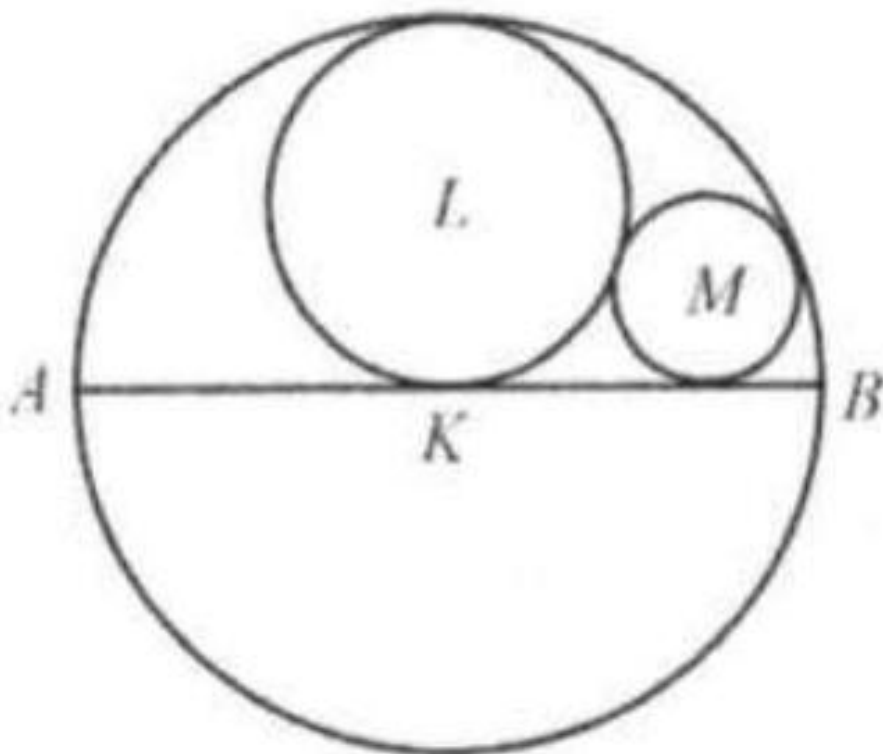


Problem 7

Problem

As shown in the figure, circle K has diameter AB ; circle L is tangent to circle K and to AB at the center of circle K ; and circle M is tangent to circle K , to circle L and to AB . Find the ratio of the areas of circles K, L, M .



Solution

16:4:1. MF is parallel to AB and intersects KL at F . Let $r, s(= r/2)$ and t be the radii of the circles with centers K, L and M , respectively. Using the

Pythagorean theorem to $\triangle FLM$ and $\triangle FKM$: $(MF)^2 = \left(\frac{r}{2} + t\right)^2 - \left(\frac{r}{2} - t\right)^2$,
 $(MF)^2 = (r - t)^2 - (t)^2$.

Solving w get $r : t = 4 : 1$. So $r : s : t = 4 : 2 : 1$.

The ratio of the areas is then is $16 : 4 : 1$.

