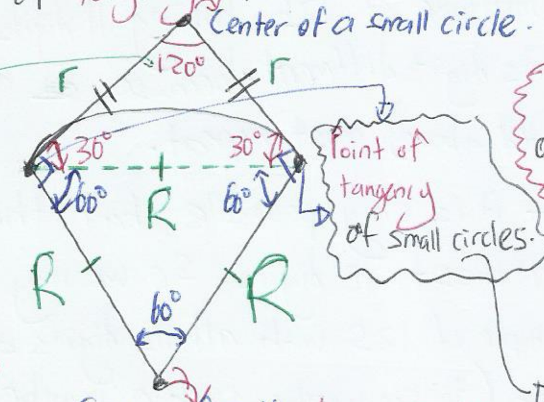
A1 We consider the following sector of the large circle to two adjacent points of tangency of the smaller circles:



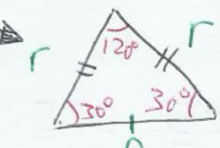
Definition: Let the radius of the large circle $= R$ and the radius of the smaller circle $= r$

because we're given that the centers of the small circle form a regular hexagon (which has an interior angle of 120°) and noting also the fact that the centers of two adjacent small circles are collinear through their point of tangency. (by symmetry).

Causes right angles between the radius of the big circle (R) and the radius of the small circle (r) at these point of tangency

Fact 1: We're given that "each small circle has an area of 6". So $\pi r^2 = 6$. or equivalently $r = \sqrt{\frac{6}{\pi}}$

With the above together with fact 1, we apply the Cosine Rule on the isosceles triangle (120°-30°-30°) above: Shown here



to get:

$$R^2 = r^2 + r^2 - 2(r)(r)\cos 120°$$

because: $\cos 120° = -\frac{1}{2}$

$$R^2 = \left(\sqrt{\frac{6}{\pi}}\right)^2 + \left(\sqrt{\frac{6}{\pi}}\right)^2 - 2\left(\sqrt{\frac{6}{\pi}}\right)\left(\sqrt{\frac{6}{\pi}}\right)\left(-\frac{1}{2}\right)$$

$$R^2 = \frac{6}{\pi} + \frac{6}{\pi} - 2\left(\frac{6}{\pi}\right)\left(-\frac{1}{2}\right)$$

$$R^2 = \frac{6}{\pi} + \frac{6}{\pi} + \frac{6}{\pi}$$

$$R^2 = \frac{18}{\pi} \longrightarrow \text{Fact 2}$$

use here!

Hence, Area of the large circle $= \pi R^2 = \pi \times \frac{18}{\pi} = 18$

$\boxed{\text{Answer: } 18}$