INSCRIBED FOUR CIRCLES OF TWO DIFFERENT RADII IN AN EQUILATERAL TRIANGLE DERIVE THE REDDY π
(2541st Paper)

1. Small circle

   Radius = 4

   Area $= \pi r^2 = \pi \times (4)^2 = 16\pi$

2. Sum of area of 3 circles

   $16\pi \times 3 = 48\pi$

3. Big Circle

   Radius = 12

   Area $= \pi r^2 = \pi \times (12)^2 = 144\pi$

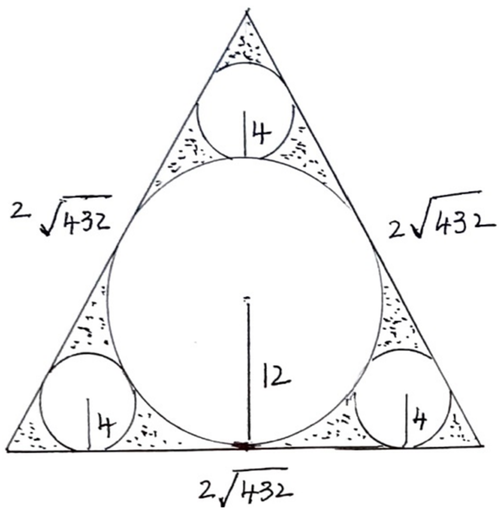
4. Sum of area of 4 circles =

   $48\pi + 144\pi = 192\pi$

5. Equilateral Triangle

   Side $= 2\sqrt{432}$

   Area $= \dfrac{\sqrt{3}}{4} \times \left\{2\sqrt{432}\right\}^2 = \dfrac{1728\sqrt{3}}{4}$



6. Let, the shaded area is equal to $\dfrac{1728\sqrt{3} - 2688 + 192\sqrt{2}}{4}$

7. Finally,

Area of 3 small circles + Area of Big Circle + Shaded area = Triangle area

8. $$48\pi + 144\pi + \frac{1728\sqrt{3} - 2688 + 192\sqrt{2}}{4} = \frac{1728\sqrt{3}}{4}$$

9. $$192\pi + \frac{1728\sqrt{3} - 2688 + 192\sqrt{2}}{4} = \frac{1728\sqrt{3}}{4}$$

10. $$\frac{768\pi + 1728\sqrt{3} - 2688 + 192\sqrt{2}}{\cancel{4}} = \frac{1728\sqrt{3}}{\cancel{4}}$$

11. $$768\pi = \cancel{1728}\sqrt{3} - \cancel{1728}\sqrt{3} + 2688 - 192\sqrt{2}$$

12. $$768\pi = 2688 - 192\sqrt{2}$$

13. $$\pi = \frac{2688 - 192\sqrt{2}}{768}$$

14. $$\pi = \frac{14 - \sqrt{2}}{4}$$

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