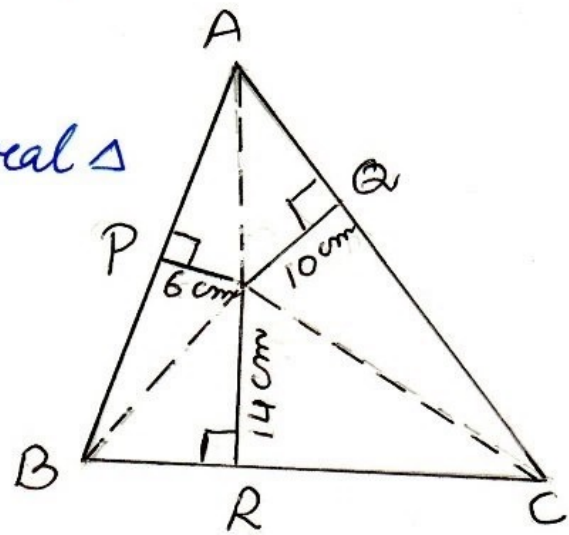


3. let each side of equilateral  $\Delta$  be  $x$



area of equilateral  $\Delta ABC =$  area of  $\Delta ABC$

$$\frac{\sqrt{3}}{4} \text{ side}^2 = \text{ar}(\Delta AOB) + \text{ar}(\Delta BOC) + \text{ar}(\Delta COA)$$

$$\frac{\sqrt{3}}{4} x^2 = \frac{1}{2} \times AB \times OP + \frac{1}{2} \times BC \times OR + \frac{1}{2} \times AC \times OQ$$

$$\frac{\sqrt{3}}{4} x^2 = \frac{1}{2} \times x \times 6 + \frac{1}{2} \times x \times 14 + \frac{1}{2} \times x \times 10$$

$$\Rightarrow \frac{\sqrt{3}}{4} x^2 = 15x$$

$$\Rightarrow \sqrt{3} x^2 = 60x$$

$$\Rightarrow \sqrt{3} x^2 - 60x = 0$$

$$\Rightarrow \sqrt{3} x (x - 20\sqrt{3}) = 0$$

$$\Rightarrow x = 0 \text{ or } x - 20\sqrt{3} = 0$$

rejected

$$\Rightarrow x = 20\sqrt{3} \text{ cm}$$

Side of  $\Delta \neq 0$

$$\therefore \text{area of } \Delta = 15 \times 20\sqrt{3} = 300\sqrt{3} \text{ cm}^2$$