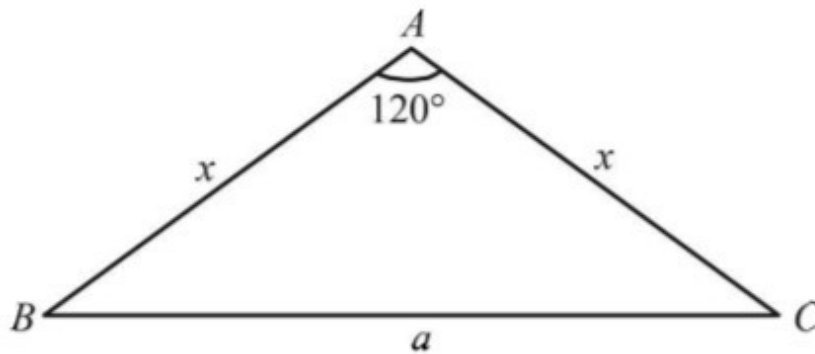**5.** One angle of an isosceles Δ is $120°$ and radius of its incircle $= \sqrt{3}$. Then the area of the triangle in sq. units is

(2006 - 3M, -1)

(a) $7 + 12\sqrt{3}$

(b) $12 - 7\sqrt{3}$

(c) $12 + 7\sqrt{3}$

(d) 4π

Solution: -

5. (c) By Sine law in ΔABC

$$\frac{x}{\sin 30°} = \frac{a}{\sin 120°} \Rightarrow a = x\sqrt{3}$$

$\therefore$ $\Delta = \dfrac{1}{2} \times x \times x \sin 120° = \dfrac{\sqrt{3}}{4} x^2$

Also, $\sqrt{3} = \dfrac{\Delta}{s} \Rightarrow \dfrac{(2x+a)}{2} \sqrt{3} = \dfrac{\sqrt{3}}{4} x^2$

$\Rightarrow x = 2(2 + \sqrt{3}) \Rightarrow \Delta = \dfrac{\sqrt{3}}{4} \times 4 (4 + 3 + 4\sqrt{3})$

$\Rightarrow \Delta = 7\sqrt{3} + 12 \text{ sq. units.}$