Let the sides of the triangle be $3x$, $4x$ and $5x$.

$\therefore$ By Heron's formula, we have

Area $= \sqrt{s(s-a)(s-b)(s-c)}$. Here, $s = \dfrac{3x+4x+5x}{2} = 6x$

$\Rightarrow \quad 384 = \sqrt{6x \cdot x \cdot 2x \cdot 3x} \Rightarrow 384 = 6x^2 \Rightarrow x^2 = 64 \Rightarrow x = 8$

$\therefore$ Required perimeter $= 3x + 4x + 5x = 12x = 12 \times 8 = 96$ cm