Label the shorter side of the A4 x and the longer, y.

As the A3 sheet is similar to the A_4 one, the ratio of sides is the same.

Therefore: $\frac{y}{x} = \frac{2x}{y}$

So $y^2 = 2x^2$

$\therefore \sqrt{2}x = y$

So the ratio of x to y is $1 : \sqrt{2}$

The ratio of sides are the same in an A0. Let's call the shorter side of A0 a.

Therefore the sidelengths are a and $\sqrt{2}a$ so the area is $\sqrt{2}a^2$ $(a \times \sqrt{2}a)$

$\sqrt{2}a^2 = 1m^2$ or $10,000\ cm^2$

$a^2 = \frac{10000}{\sqrt{2}} cm^2$

Square the whole equation: $a^4 = \frac{100000000}{2}\ cm^2$

$a^4 = 50\ 000\ 000$

$a = \sqrt[4]{50\ 000\ 000} = 84.08964153$

So the longer side is this times $\sqrt{2}$ which is 118.9207115

Each side of A2 is half each side of A0 and each side of the A4 is half the size of each side of A2.

Therefore we can work out the side lengths of an A4 by dividing both A0 side lengths by 4.

So the longer side is 29.7cm (3.S.f) and the shorter is 21.0cm (3.S.f)

A4 : 29.7 x 21.0
A3 : 42.0 x 29.7
A2 : 59.5 x 42.0
A1 : 84.1 x 59.5
A0 : 119.0 x 84.1

(all rounded to 3 significant figures)

As the ratio between each sides is $1 : \sqrt{2}$ to scale down side lengths an A3 poster to an A4 one would require scaling down by 29.3% because an A4 sheet's side lengths are $\frac{1}{\sqrt{2}}$ of the size of an A3 sheet's side lengths.