

September 4th

A border of uniform width surrounds a photograph measuring 6cm by 8cm.  
The area of the border is 1.5 times that of the photograph.

*What is the width of the border?*

The frame has half the width of the border.

*Is the area of the frame more or less than the border?*

*Is the area of the frame more or less than the photograph?*

If the width of the border is  $w$

Then  $(8+2w)(6+2w) - 48 = 1.5 \times 6 \times 8$

Hence  $28w + 4w^2 = 72$

Therefore  $w^2 + 7w - 18 = 0$

Factorising  $(w+9)(w-2) = 0$

So  **$w=2$**

Frame has width 1, therefore

Total area of the whole rectangle =  $12 \times 14 = 168\text{cm}^2$

$\therefore$  area of frame =  $168 - 120 = 48\text{cm}^2$

Photograph =  $48\text{cm}^2$

Border =  $72\text{cm}^2$

Frame =  $48\text{cm}^2$

**$\therefore$  Area of frame < area of border**

and

**Area of frame = area of photograph**