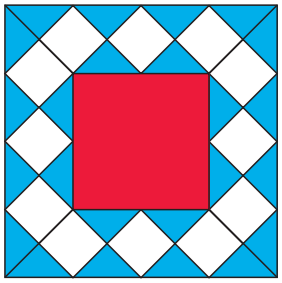
YOU & MATHS Betsy designed a flag using blue triangles, small white squares, and a red center square, as shown. Let B the total area of the blue triangles, W the total area of the white squares, and R the area of the red square.



Which of the following is correct?

A $B = W$

B $W = R$

C $B = R$

D $3B = 2R$

E $2R = W$

In the figure, there are 24 blue triangles, 12 white squares and 1 red square.

It can easily be seen that the legs of the blue isosceles right triangles have the same length as the sides of the white squares. Knowing that the area of a blue triangle can be calculated as $\frac{l^2}{2}$ (as they are right triangles) and that the area of a white square is l^2, it follows immediately that:

Area of a white square $= 2 \cdot$ Area of a blue triangle.

Therefore we have that the total area of the white squares is equal to:

$W = 12 \cdot$ Area of a white square $= 12 \cdot (2 \cdot$ Area of a blue triangle$) = 24 \cdot$ Area of a blue triangle $= B$.

The correct answer is A.

For completeness, let us make some considerations on the area of the red square as well. Its side is as long as twice the hypotenuse of a blue triangle, which in turn is as long as the diagonal of a white square. Recalling that the length of the diagonal of a white square is $\sqrt{2}\,l$, it follows that the length of the side of the red square is $2\sqrt{2}\,l$. Therefore,

$R =$ Area of red square $= (2\sqrt{2}\,l)^2 = 8l^2 = 8 \cdot$ Area of a white square $= 16 \cdot$ Area of a blue triangle.

It is even clearer now than none of the other answers is possible.