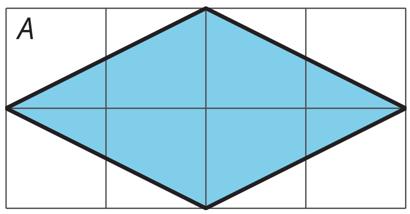
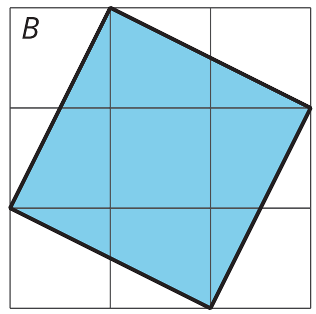
The Areas of Squares

Let's investigate the areas of squares.

1.1 Two Regions

Which shaded region is larger? Explain your reasoning.





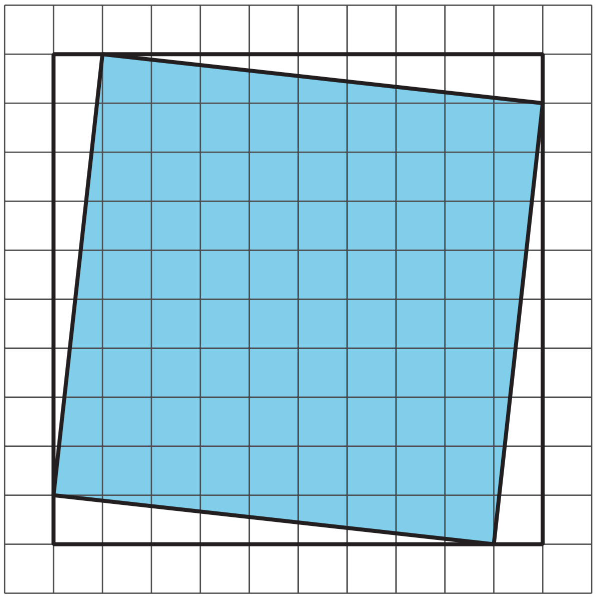
1.2 Making Squares

Your teacher will give your group a sheet with three squares and 5 cut-out shapes labeled D, E, F, G, and H. Use the squares to find the total area of the five shapes. Assume each small square is equal to 1 square unit.

1.3 Decomposing to Find Area

Find the area of each shaded square (in square units).

1.



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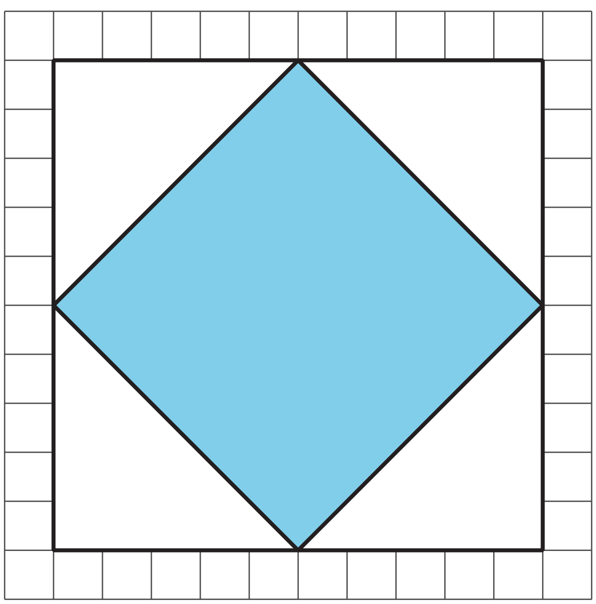

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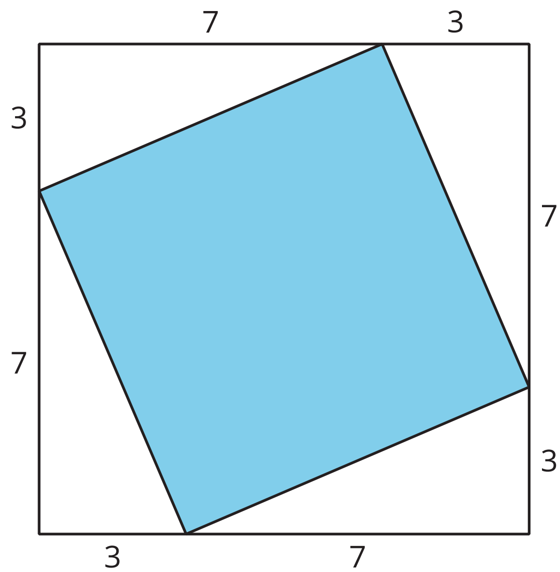
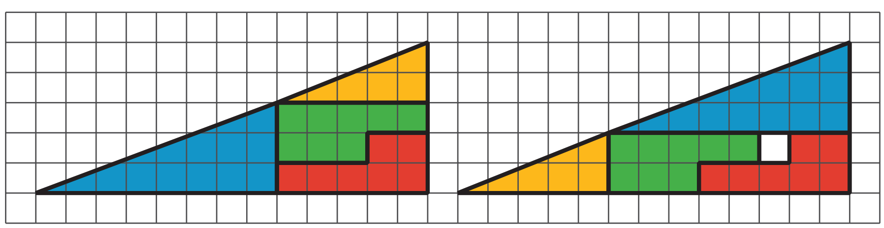


Are you ready for more?

Any triangle with a base of 13 and a height of 5 has an area of $\frac{65}{2}$.

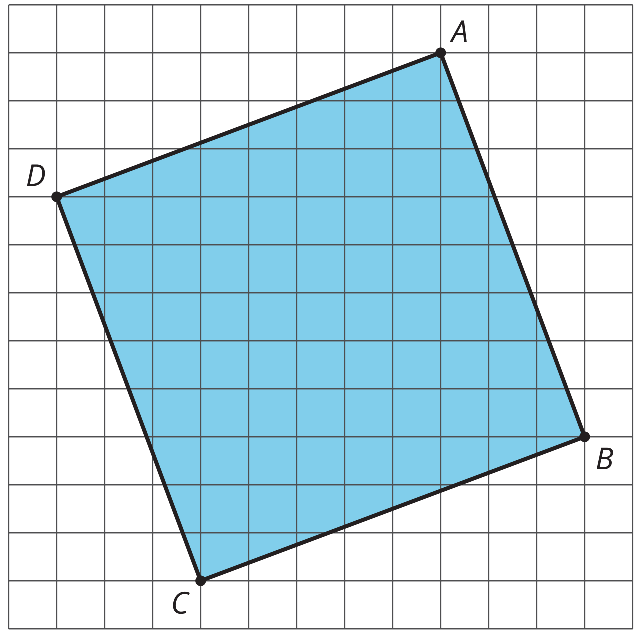


Both shapes in the figure have been partitioned into the same four pieces. Find the area of each of the pieces, and verify the corresponding parts are the same in each picture. There appears to be one extra square unit of area in the right figure. If all of the pieces have the same area, how is this possible?

Lesson 1 Summary

The area of a square with a side length of 12 units is 12^2 or 144 units^2.

Sometimes we want to find the area of a square but we don't know the side length. For example, how can we find the area of square $ABCD$?



One way is to enclose it in a square whose side lengths we do know.

The outside square $EFGH$ has side lengths of 11 units, so its area is 121 units^2. The area of each of the four triangles is $\frac{1}{2} \cdot 8 \cdot 3 = 12$, so the area of all four together is $4 \cdot 12 = 48$ units^2.

To get the area of the shaded square, we can take the area of the outside square and subtract the areas of the four triangles. So the area of the shaded square $ABCD$ is $121 - 48 = 73$ units^2.