

## Dividing a square into 5 squares of equal area.

Your grandma bought a square piece of chocolate. She needs to cut it into 5 equal pieces to give out to you and your 4 other cousins. As an expert in graphics, you need to come up with a geometric plan how to cut out the square chocolate. These are the rules:

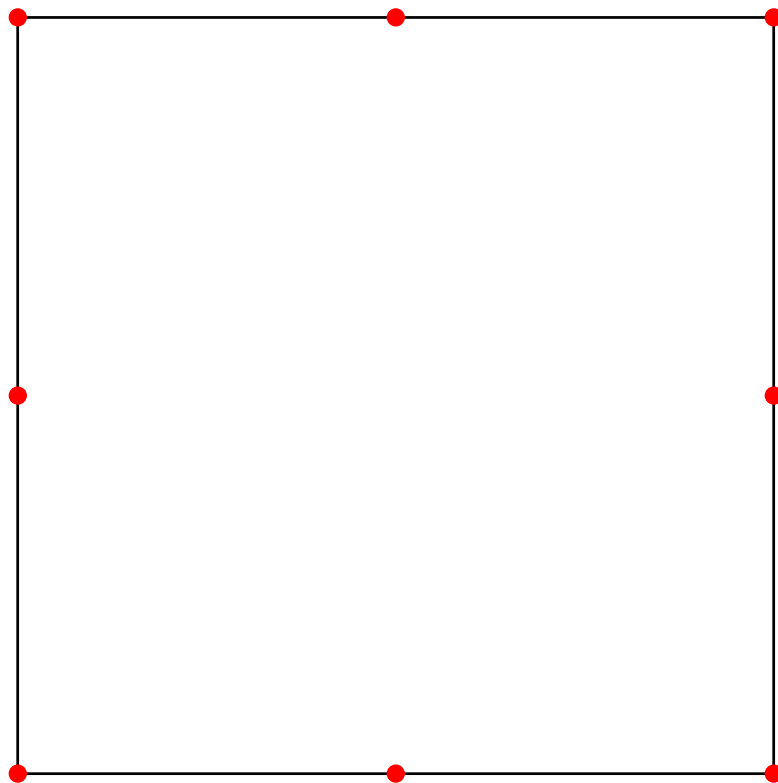
1. Each child should get a square piece of chocolate of the same area.
2. No one is allowed to have more chocolate than the others.
3. You can only use straight lines and the 8 red points shown below to divide the square.
4. You can cut the square into more than 5 pieces and then join them together to form 5 equal squares.



Try this challenge and think about it well. You might use the trial and error method to reach to your solution, and if you cut a model of the square it might be easier. You can check your solution against the wrong attempts on page 3 and the correct answer on page 4.

## Dividing a square into 5 squares of equal area - STARTER SHEET

Use the square shown below, and try out different ideas. This puzzle involves cutting and rearranging. Remember you can only use the red dots as cutting points. Good luck.

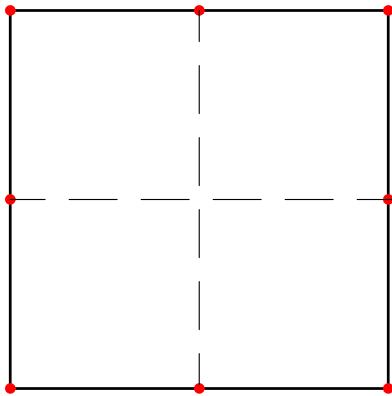


## Dividing a square into 5 squares of equal area - WRONG ANSWERS

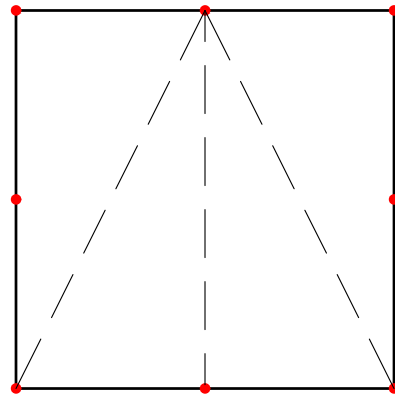
You might have tried the following solutions but for each one you will find the reason it is not correct below:

1. This is obviously wrong because the square is divided into 4 and not 5 equal parts.
2. The square is divided into just 4 right-angled triangles
3. The square is divided into 4 triangles and 1 large square.
4. The shaded part gives us  $\frac{3}{16}$ , which is less than  $\frac{1}{5}$ , therefore this is wrong as well.

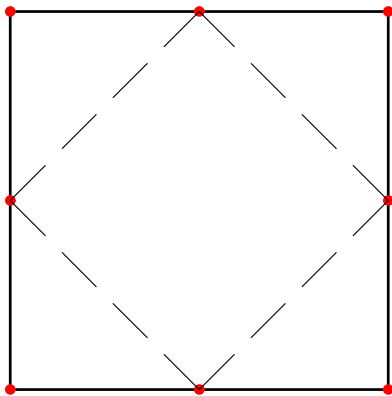
1.



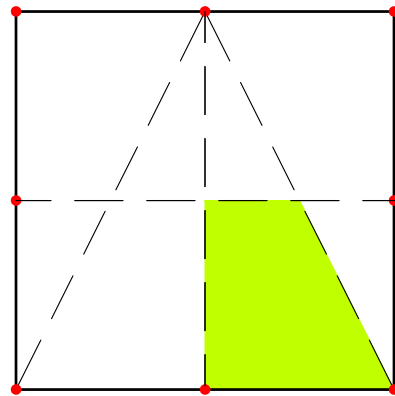
2.



3.



4.



Give is some more thought... you might find the solution without checking the answer on the next page. Good luck.

## Dividing a square into 5 squares of equal area - ANSWER SHEET

The correct answer is given below. You will need to cut out the outside quadrilaterals and triangles, and rearrange them to make up the other 4 squares. In the end you will have 5 equal pieces of chocolate, and your grandma will be very proud of you!

