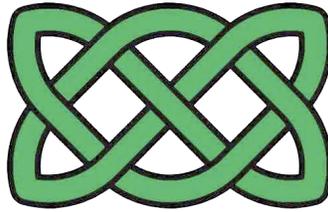


# Mathletes Problem of the Week #25

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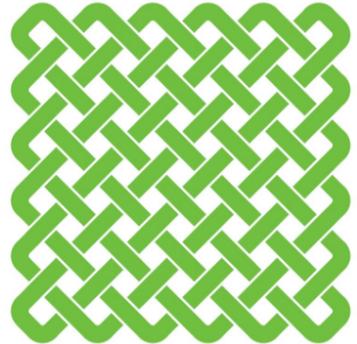
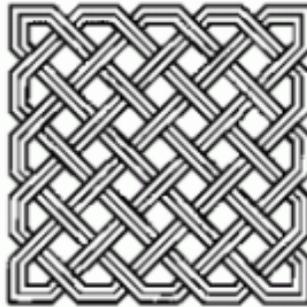
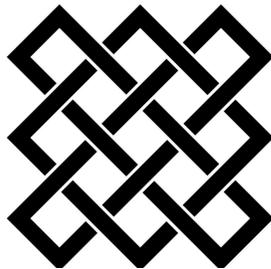
## Celtic Knots



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This week we will look at **Celtic Knots**, which are decorative knot patterns that were often used in ancient Celtic monuments and manuscripts. They are also rather interesting mathematically! These knots are created by having lines alternately cross over and under other lines and then loop back to the beginning. Pick a starting point in the design above and trace the path. Do you see how it goes over and then under and then over and under again and again? Some knot patterns are formed from a single loop like the one above, but others are made from several loops. Your task this week is to try to figure out how many loops are in each of the knot patterns below!

- a. How many loops are in the square-shaped knots below?



- b. What do you notice about these square-shaped knots and the number of loops they contain? Can you come up with a rule and explanation for what you notice?

*(more puzzles on the next pages!)*

**Solutions & Explanations:** (Try one or try them all! Record your explanations below or on a separate sheet of paper.)

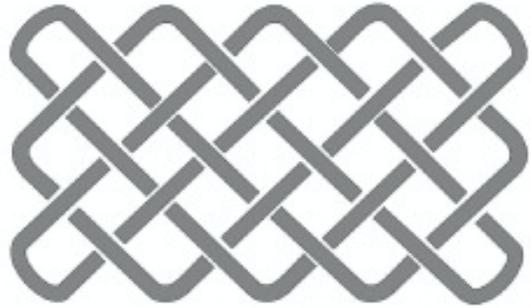
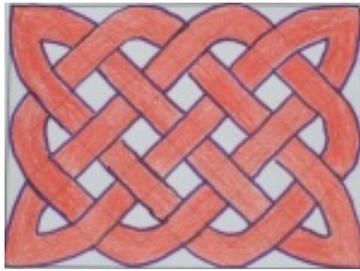
Name \_\_\_\_\_

Class \_\_\_\_\_

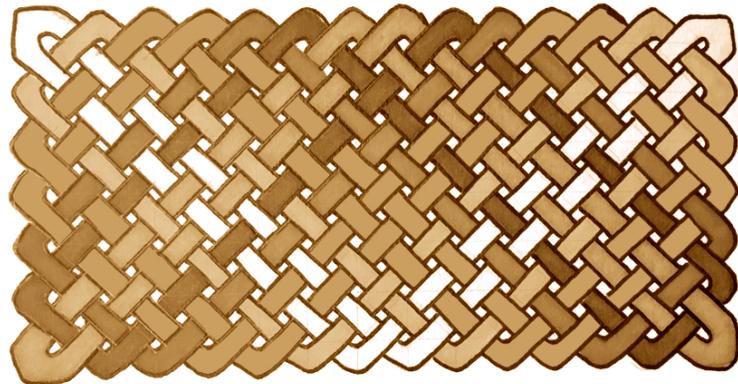
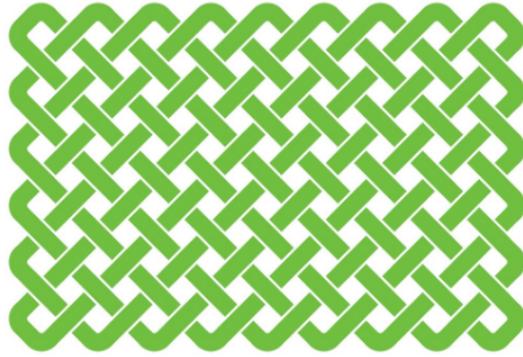
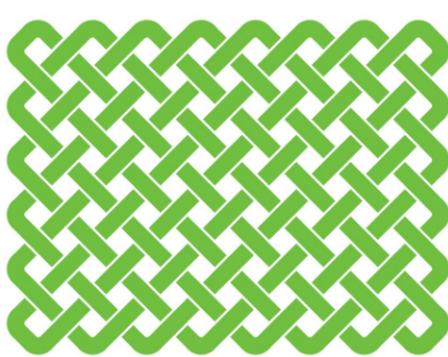
**(First and last name, please!)**

**Solutions due: June 19<sup>th</sup>**

c. How many loops are in the rectangular knots below?



d. How many loops are in these rectangular knots?



© arbitrarilyclose.com

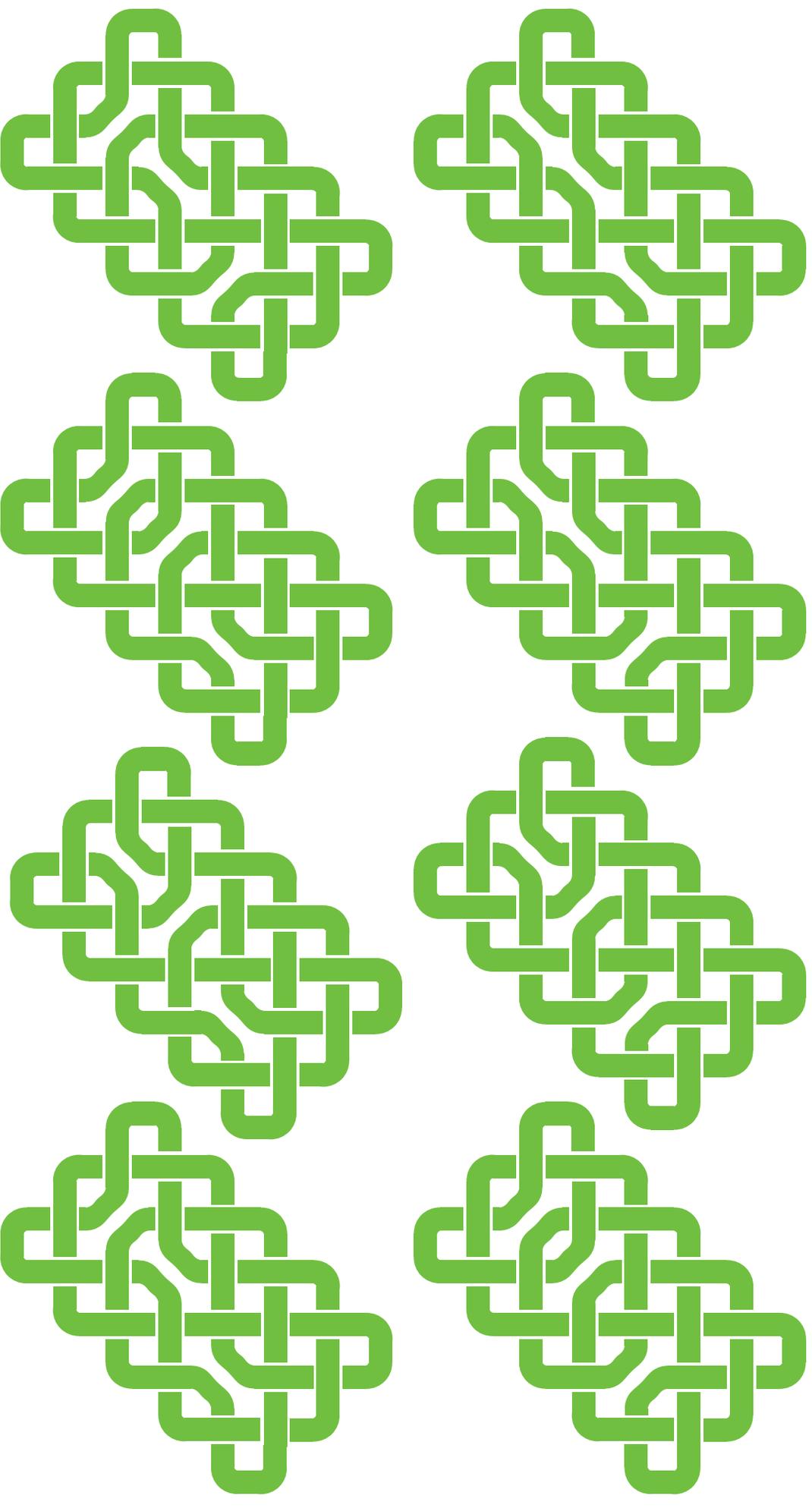
e. What do you notice about all these rectangular knots and the number of loops they contain? Can you come up with a rule and explanation for what you notice?

f. Try out the attached puzzle sheets with some less regular knot patterns. Can you figure out how many loops are in each one?

g. Print out the blank template and try making some Celtic knots of your own!

## Celtic Counter

These knots are all different. Count the number of loops in each one.



# Celtic Counter

These knots are all different. Count the number of loops in each one.

