

This document will help you to...
Investigate Mathematical Problems!

Maths Problem Solving Part 4

Have you had enough of working on My Maths?

Would you rather get out some pen and paper and investigate maths problems?

THIS BOOKLET IS FOR YOU!

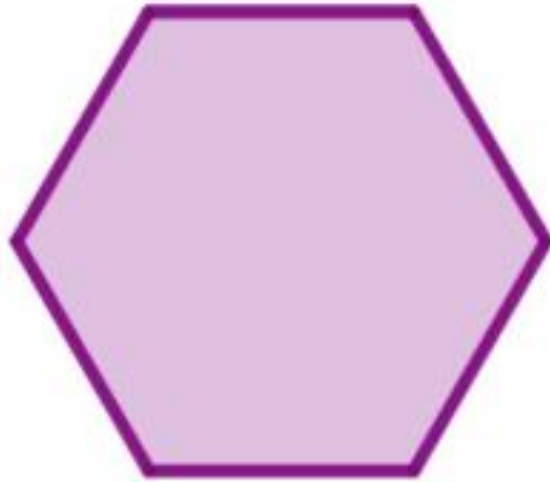
There are 10 problems for you to make your way through. None of them are quick so be patient and don't give up!

GOOD LUCK!



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Symmetry



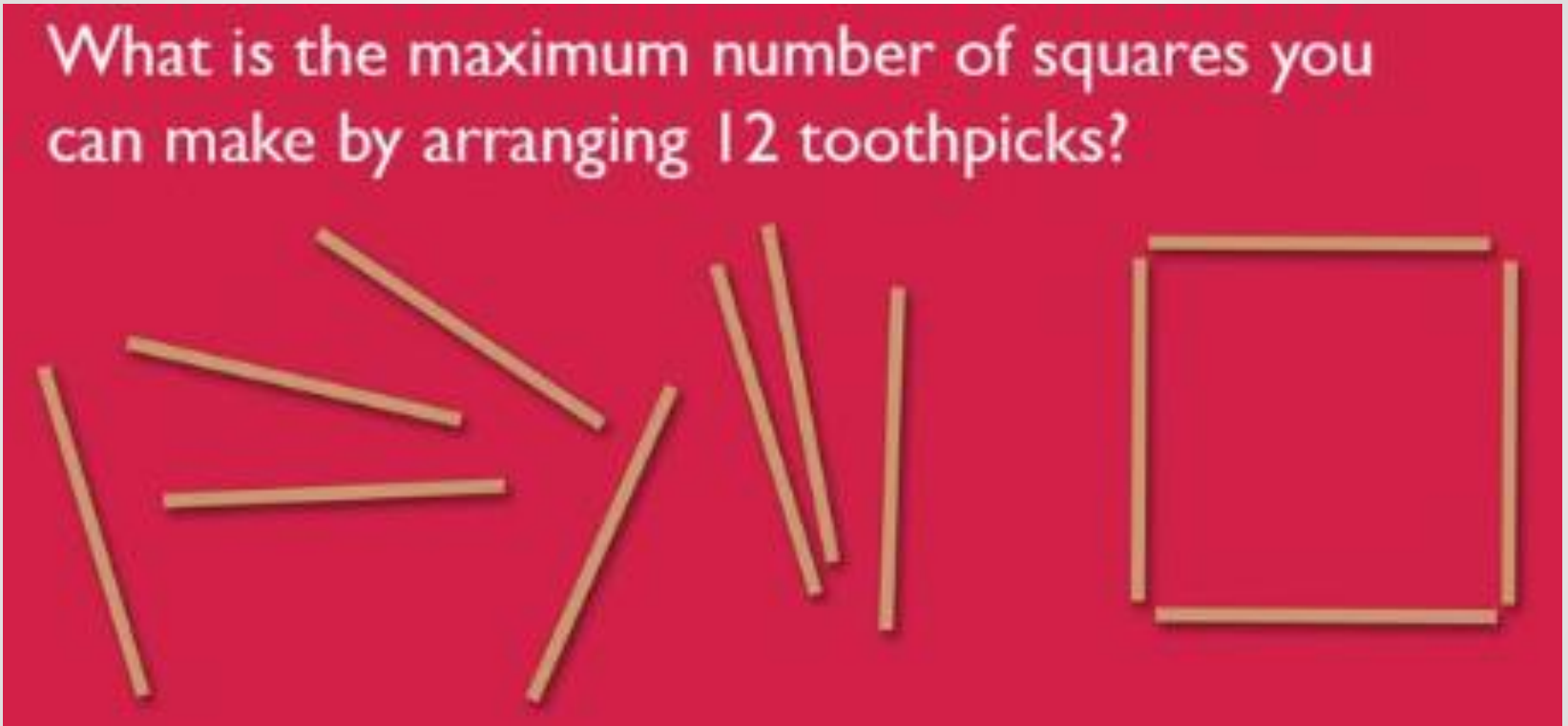
In how many different ways can a regular hexagon be cut into two pieces of equal area by a single straight line cut?



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Squares

What is the maximum number of squares you can make by arranging 12 toothpicks?

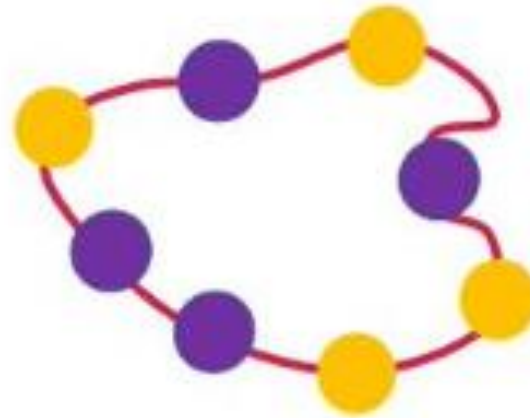


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Bracelets

How many
unique bracelets
can she make
using four purple
beads and four
yellow beads?

Sarah is making a charm bracelet to
give as a Christmas present.



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Rounding

Find as many numbers as possible that can be rounded to 6000 using the digits shown here.

Make sure you state the nearest unit you are rounding to.

3 4 5 6 1 2



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Beans

How are these
calculations
the same or
different?

$$\frac{36}{4}$$

$$12 \div 4 \times 3$$

$$36 \div 4$$

$$3 \times \frac{12}{4}$$

$$\frac{3}{4} \text{ of } 12$$

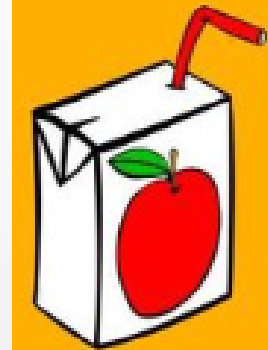
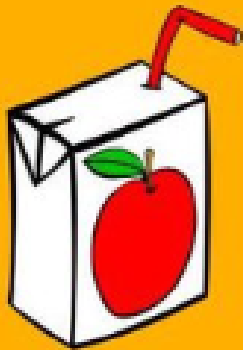
$$\frac{12 \times 3}{4}$$



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Bottles

In California, a bottle of orange juice costs \$3, but when you return the bottle you get \$2 back. What is the largest number of bottles of juice you can buy if you start with \$10?



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Magic Square?

$a + 2b + c$	c	$2a + b + c$
$2a + c$	$a + b + c$	$2b + c$
$b + c$	$2a + 2b + c$	$a + c$

substitute $a = 4$, $b = 5$ and $c = 2$

does this make a magic square (do the rows, columns and two diagonals add up to the same number)?

will it **always** be magic?

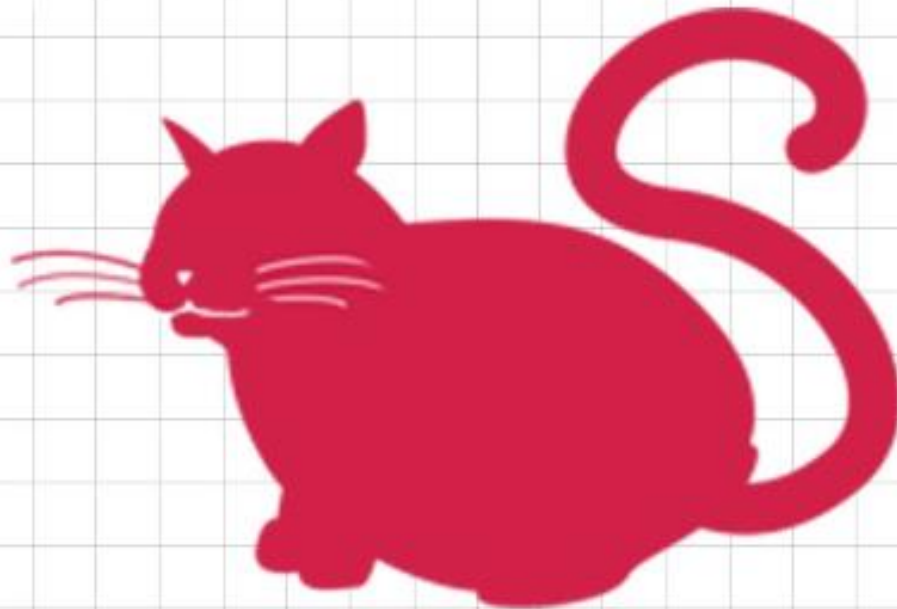


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Percentages

In the city of Great Rhombusia, 40% of people own cats.
16% of cat owners (or 1240 people) own dogs.

How many people live in Great Rhombusia?



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Venn Diagrams



At the Upper Kingswood Modern Technical school, there are 142 A-level students.

Of these students, 65 are studying Mathematics, 38 Physics, and 49 History. There are 27 students studying Mathematics and Physics, but not History; 4 studying History and Physics, but not Mathematics; and 12 studying History and Mathematics, but not Physics.










43 students study none of these subjects.

How many students are studying Mathematics, Physics and History?



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Equations

			108
			102
			95

Each shape represents a number.

The sum of each row is shown at the right of the table.

Find the value of each of the shapes.

