

# CoPA Maths Summer Puzzles

There are 12 puzzles, each a different level of difficulty. The first page is slightly easier than the second page – but no puzzle is impossible!

Can you choose six puzzles, and solve one each week?

Can you solve all 12 puzzles?

The diagram shows three different views of the same cube. Which letter is on the face opposite U?



The word "THIRTY" has 6 letters, and  $30 = 6 \times 5$ . Similarly, the word "FORTY" has 5 letters, and  $40 = 5 \times 8$ .

Which of the following words is NOT a multiple of the number of letters in it?

- a) SIX
- b) TWELVE
- c) EIGHTEEN
- d) SEVENTY
- e) NINETY

Pinocchio's nose is 5cm long. Each time he tells a lie, his nose doubles in length. After he has told nine lies, his nose will be roughly the same length as a:

- a) Domino
- b) Tennis racket
- c) Snooker table
- d) Tennis court
- e) Football pitch

Amy, Ben and Chris are standing in a row.

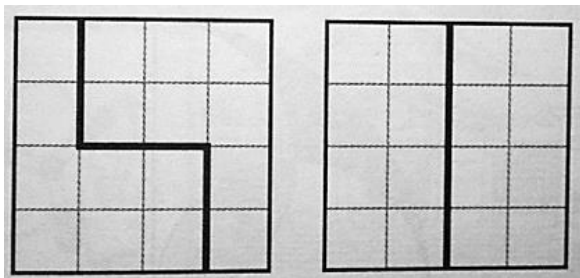
Amy is to the left of Ben.

Chris is to the right of Amy.

Which of the statements is true?

- a) Ben is furthest to the left.
- b) Chris is furthest to the right.
- c) Amy is in the middle.
- d) Amy is furthest to the left.
- e) None of the statements above is true.

A big square is divided into sixteen small squares. The figure shows two ways to cut this big square in two identical pieces:



There are four more ways to do this.

Can you find them all?

(Rotating a solution by  $90^\circ$  doesn't count!)

If you like, you could fold a paper square in half twice, in both directions, to get a large square with 16 smaller squares inside it.

Find out how much each letter is worth, to make the following sum correct:

$$\begin{array}{r}
 \text{D O U B L E} \\
 \text{D O U B L E} \\
 + \quad \text{T O I L} \\
 \hline
 \text{T R O U B L E}
 \end{array}$$

Bonus  
Question



Which shape is the odd one out, and why?

John, Paul, George and Ringo are at one side of a gorge, connected to the other side by a weak, rickety bridge.

Only two people can cross the bridge at a time. It is night, and the crossing is dangerous. Whoever is crossing must carry a torch.

The group has a single torch, so they cannot risk losing it by throwing the torch across the bridge.

John can cross the bridge in 1 minute, Paul in 2, George in 5, and Ringo in 10. If two people cross together, they walk at the speed of the slowest person.

How can they all get to the other side as quickly as possible?

Hint: the fastest way takes only 17 minutes.

You are offered a new job, with a starting salary of £10,000 a year.

Your boss asks you to choose one of two ways that your salary can grow:

- A) a £500 raise every six months.
- B) a £2000 raise every year.

Which plan do you choose?

Adam and Belle play Rock, Paper, Scissors ten times. Here is what happened:

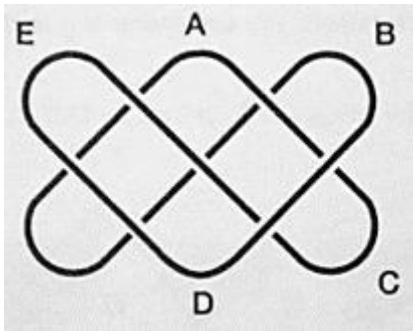
- Adam used 3 rocks, 6 scissors, 1 paper.
- Belle used 2 rocks, 4 scissors, 4 papers.
- There were no ties.
- You don't know in which order they played.

Who won, and by how many points?

The diagram shows a Lusona, a sand picture drawn by the Tchokwe people from the West Central Bantu area of Africa.

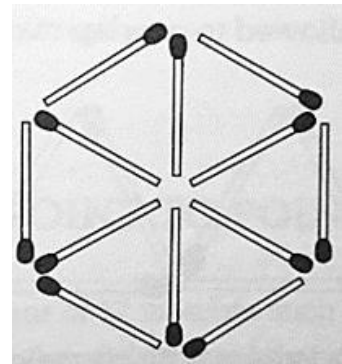
To make a Lusona, the artist uses a stick to draw a single line in the sand, starting and ending at the same point, without lifting the stick from the sand.

At which point could this Lusona have started?



Note: when lines cross, the broken line is the one that was drawn first, and the unbroken line goes over it.

Place 12 matches in a hexagon, to make six equilateral triangles.



You are never allowed to leave loose ends.

- a) Move two matches to different positions, to make exactly five equilateral triangles.
- b) From the new pattern, move two matches to different positions, to get only four equilateral triangles.
- c) Can you move two more matches, so that there are only three equilateral triangles left?

A flask contains black coffee. A jug contains milk.

You pour some coffee on the jug and stir it.

Then, you pour some of the mixture back in the flask, so that the amount of liquid in both containers is the same as it were at the start.

- Is there more coffee in the jug than milk in the flask? Or is it the other way round? Or something else?