

Logic (Junior UKMT)

These questions must be attempted without a calculator

Topics covered in the questions below may not necessarily be from the topic of the title.

1. WHICH LETTER DOES NOT OCCUR MORE THAN ONCE IN THIS QUESTION – INCLUDING THE FIVE OPTIONS?

A B C D E

2. Each of the nine small squares in the diagram are to be filled so that each row and each column contains one 1, one 2 and one 3 in some order.

What must $M + N$ be?

		M
	2	N
1		

A 2 B 3 C 4 D 5 E 6

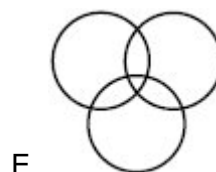
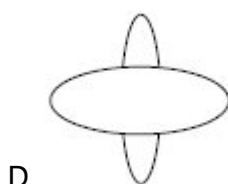
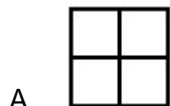
3. Four crosses are to be placed in this 4 by 4 grid so that no two crosses go in the same row or column, or in any of the ten 'diagonals'. The position of the first cross is given.

Where must the cross go in the third column?

		D	
		C	
X		B	
		A	

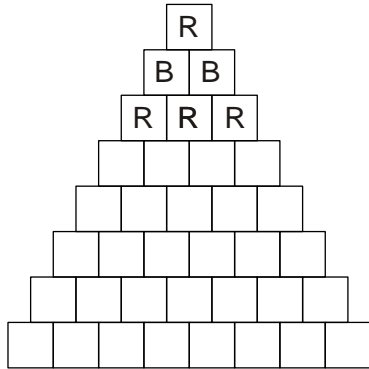
A B C D E can't be sure

4. Which of these diagrams could be drawn without taking the pen off the page and without drawing along a line already drawn?



5. Donna is making a coloured tower as shown. She has thirty six small cubes, with equal numbers of red (R), blue (B) and yellow (Y). Each row is of one colour, and no two rows which are next to each other are the same colour. The top three rows are coloured as indicated.

What colour must the bottom row be?



- A red B blue C yellow D can't be done E can't be sure

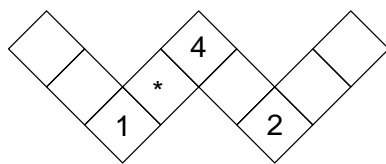
6. A newspaper has thirty six pages.

Which other pages are on the same sheet as page 10?

- A 9, 11, 12 B 11, 12, 13 C 9, 27, 28 D 9, 29, 30 E 11, 26, 27

7. The numbers from 1 to 9 inclusive are to be placed, one number to a square, in the figure shown, so that the total of the three numbers in each of the four lines is the same.

What number should replace * ?



- A 5 B 6 C 7 D 8 E 9

8. How many of the statements in the box are true?

None of these statements is true.
 Exactly one of these statements is true.
 Exactly two of these statements are true.
 All of these statements are true.

- A 0 B 1 C 2 D 3 E 4

9. Travelling by train from Edinburgh to London, I passed a sign saying "London 150 miles". After 7 more miles, I passed another sign saying "Edinburgh 250 miles".

How far is it by train from Edinburgh to London?

- A 407 miles B 393 miles C 257 miles D 243 miles E 157 miles

10. Five children Z, A, B, C, D are playing a game using a set of ten cards numbered from 1 to 10. They are each dealt two cards with the following totals: Z = 4, A = 11, B = 12, C = 13, D = 15.

Who has the card number 9?

- A B C D E can't be sure

11. In a magic square each row, each column and both main diagonals have the same total.

What number should replace x in this partially completed magic square?

13		
5		15
x		

- A 4 B 9 C 10 D 12 E more information needed

12. If the square is completed with the letters A, B, C, D and E so that no row, column or either of the two main diagonal lines contains the same letter more than once, which letter should replace the asterisk?

	*			A
		B		
D		C		
			E	

- A B C D E