

## Area and integers (Junior UKMT)

These questions must be attempted without a calculator

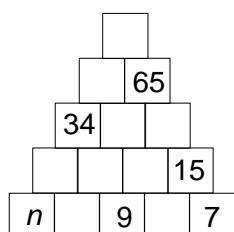
Topics covered in the questions below may not necessarily be from the topic of the title.

1. What is the value of  $6002 - 2006$ ?

A 3994          B 3996          C 4000          D 4004          E 4006

2. Each block shown in this tower is to have a number displayed on it. Some are already done. For each block above the bottom row, the number on it should be the sum of the numbers on the two blocks it stands upon.

What number should replace  $n$ ?



A 3                  B 6                  C 10                  D 11                  E 13

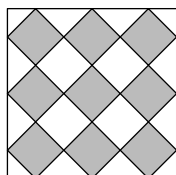
3. In the rules of Association Football, Law 1 states that the field of play must be rectangular and have length from 100 to 130 yards, and width from 50 to 100 yards.

What is the difference in area between the smallest possible field of play and the largest possible field of play?

A 1300 square yards          B 5000 square yards          C 8000 square yards  
D 10 000 square yards          E 13 000 square yards

4. In the diagram, the small squares are all the same size.

What fraction of the large square is shaded?



A  $\frac{9}{20}$           B  $\frac{9}{16}$           C  $\frac{3}{7}$           D  $\frac{3}{5}$           E  $\frac{1}{2}$

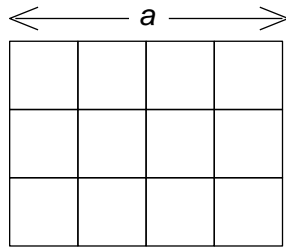
5. For £2, a stamp machine gives a mixture of 20p and 26p stamps worth a total of £2.02.

How many 20p stamps are included?

A 1                  B 3                  C 5                  D 8                  E 10

6. The diagram shows a rectangular wire grid which forms twelve small squares. The length of the grid is  $a$ .

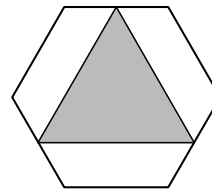
What is the total length of wire required to make the grid?



- A  $9a$       B  $\frac{17a}{2}$       C  $\frac{31a}{4}$       D  $7a$       E  $\frac{13a}{2}$

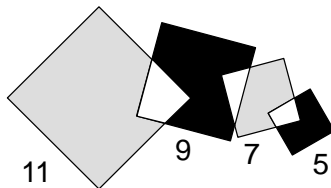
7. The diagram shows an equilateral triangle with its corners at the mid-points of alternate sides of a regular hexagon.

What fraction of the area of the hexagon is shaded?



- A  $\frac{1}{2}$       B  $\frac{1}{3}$       C  $\frac{3}{8}$       D  $\frac{4}{9}$       E  $\frac{7}{12}$

8. The diagram shows four overlapping squares which have sides 5, 7, 9 and 11.



What is the difference between the total area shaded grey and the total area shaded black?

- A 25      B 36      C 49      D 64      E more information needed

9. The digits in the product  $13 \times 2 = 26$  can be rearranged to give  $16 \times 2 = 32$  as well as  $31 \times 2 = 62$ .

In which one of the following can the digits not be rearranged to give another correct product?

- A  $12 \times 3 = 36$       B  $12 \times 7 = 84$       C  $26 \times 3 = 78$       D  $16 \times 3 = 48$       E  $39 \times 2 = 78$

10. In this addition each letter stands for a different digit, with S standing for 3.

What is the value of  $Y \times O$ ?

$$\begin{array}{r} \phantom{+} \phantom{M} \phantom{A} \phantom{N} \phantom{Y} \\ + \phantom{M} \phantom{A} \phantom{N} \phantom{Y} \\ \hline \phantom{+} \phantom{M} \phantom{A} \phantom{N} \phantom{Y} \\ \phantom{+} \phantom{M} \phantom{A} \phantom{N} \phantom{Y} \\ \phantom{+} \phantom{M} \phantom{A} \phantom{N} \phantom{Y} \end{array}$$

- A 0      B 2      C 36      D 40      E 42