**STATION 1**

- (a) $15(a + b + c) = 'abc'$, where a , b and c are digits, so that $'abc'$ is a 3-digit number.

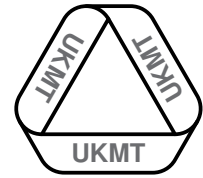
What is the value of $'abc'$? [2 marks]

- (b) $24(d + e + f) = 'def'$, where d , e and f are digits, so that $'def'$ is a 3-digit number.

What is the value of $'def'$? [2 marks]

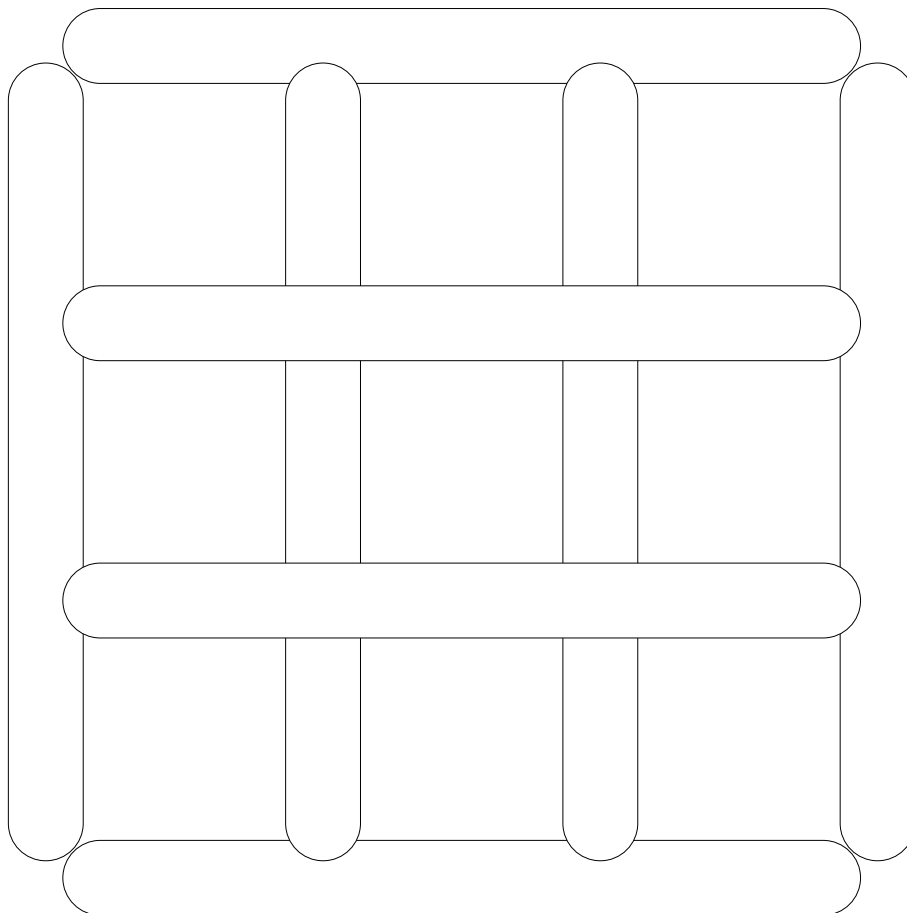
- (c) $11(g + h + i) = 'ghi'$, where g , h and i are digits, so that $'ghi'$ is a 3-digit number.

What is the value of $'ghi'$? [2 marks]



STATION 2

- (a) The grid below contains a total of 14 squares. The grid has been formed using eight sticks.

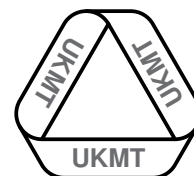


Remove two sticks to leave exactly three squares of different sizes. [3 marks]

- (b) Arrange nine sticks to form a figure which contains exactly six squares.

You are allowed to place one stick over another, but the edges of each square in your answer must be either a full stick or part of a stick.

[3 marks]

**STATION 3**

Garron and Zoey take turns shading some of the unshaded cells in the 2×4 grid below.

At each turn the unshaded cell, or cells, that they shade are in the shape of a square or a rectangle.

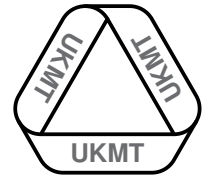
The person who has no cells left to shade *loses* the game.

Garron starts first and shades just cell A2, as shown.

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| A | | | | |
| B | | | | |

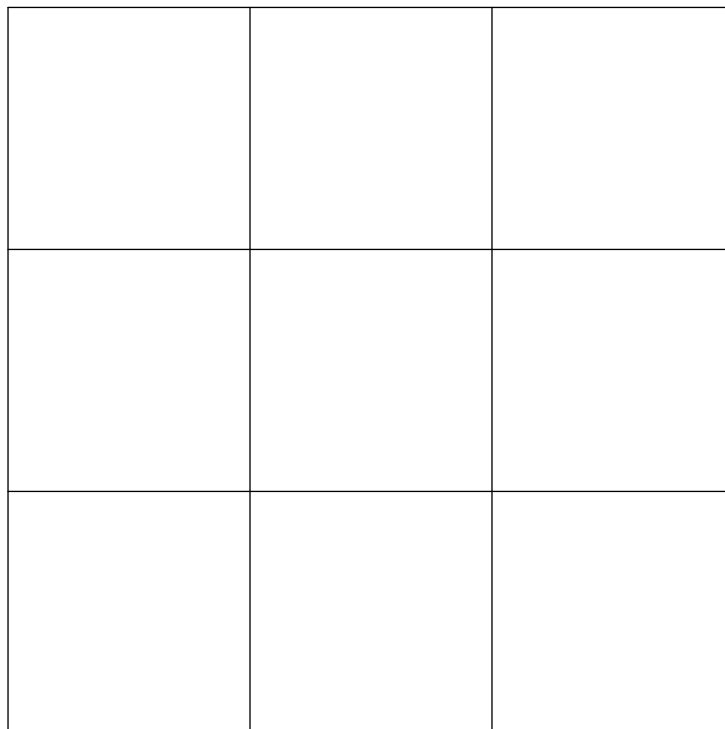
On Zoey's first turn, she also chooses to shade just one cell.

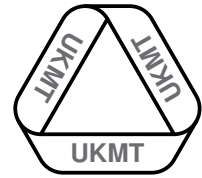
On the worksheet, mark a cross on the possible cells that Zoey could shade on her first turn in order to force a win.

**STATION 4**

You have three red, three yellow and three green cards to place on a grid. Place one card in each square on the grid below so that:

Each red card touches a yellow card edge to edge.
Each yellow card touches a green card edge to edge.
Each green card touches a red card edge to edge.
All nine cards are used.

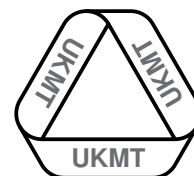




STATION 5

The number of positive factors of 30 is eight, namely 1, 2, 3, 5, 6, 10, 15 and 30.

- (a) How many positive factors does 210 have? [2 marks]
- (b) How many positive factors does 630 have? [2 marks]
- (c) How many positive factors does 510 510 have? [2 marks]

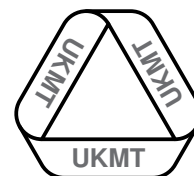


STATION 6

You are given an L-shape.

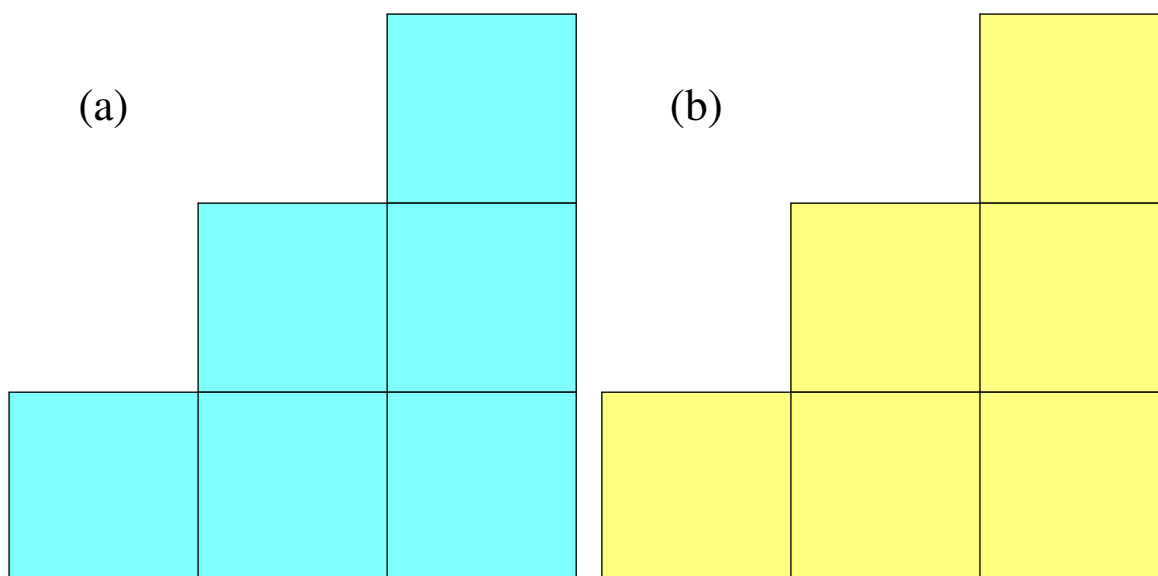
Divide the shape into eight congruent quadrilaterals.

You are expected to use a pencil and a ruler.



STATION 7

You are given two grids, each consisting of six cells.



Place the prime cards 2, 3, 5, 7, 11 and 13, of the appropriate colour, once each in a blank cell, so that:

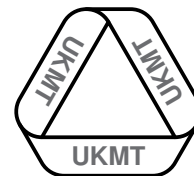
- (i) the total of the numbers in each of the three rows is equal to a prime less than 25; and
- (ii) the total of the numbers in each of the three columns is equal to a prime less than 25;

where

- (a) the number of different totals is *more* than four. [3 marks]

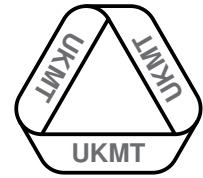
and

- (b) the number of different totals is *fewer* than four. [3 marks]

**STATION 8**

The 5×4 grid provided consists of congruent cells. You have been given 14 counters.

Place one counter in each of 14 of the cells of the grid, so that each row and each column contains an even number of counters.



STATION 1 WORKSHEET

(a)

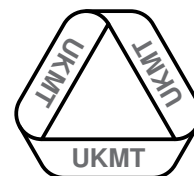
'abc':

(b)

'def':

(c)

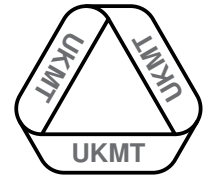
'ghi':



STATION 3 WORKSHEET

1 2 3 4

| | | | | |
|---|--|--|--|--|
| A | | | | |
| B | | | | |



STATION 5 WORKSHEET

(a)

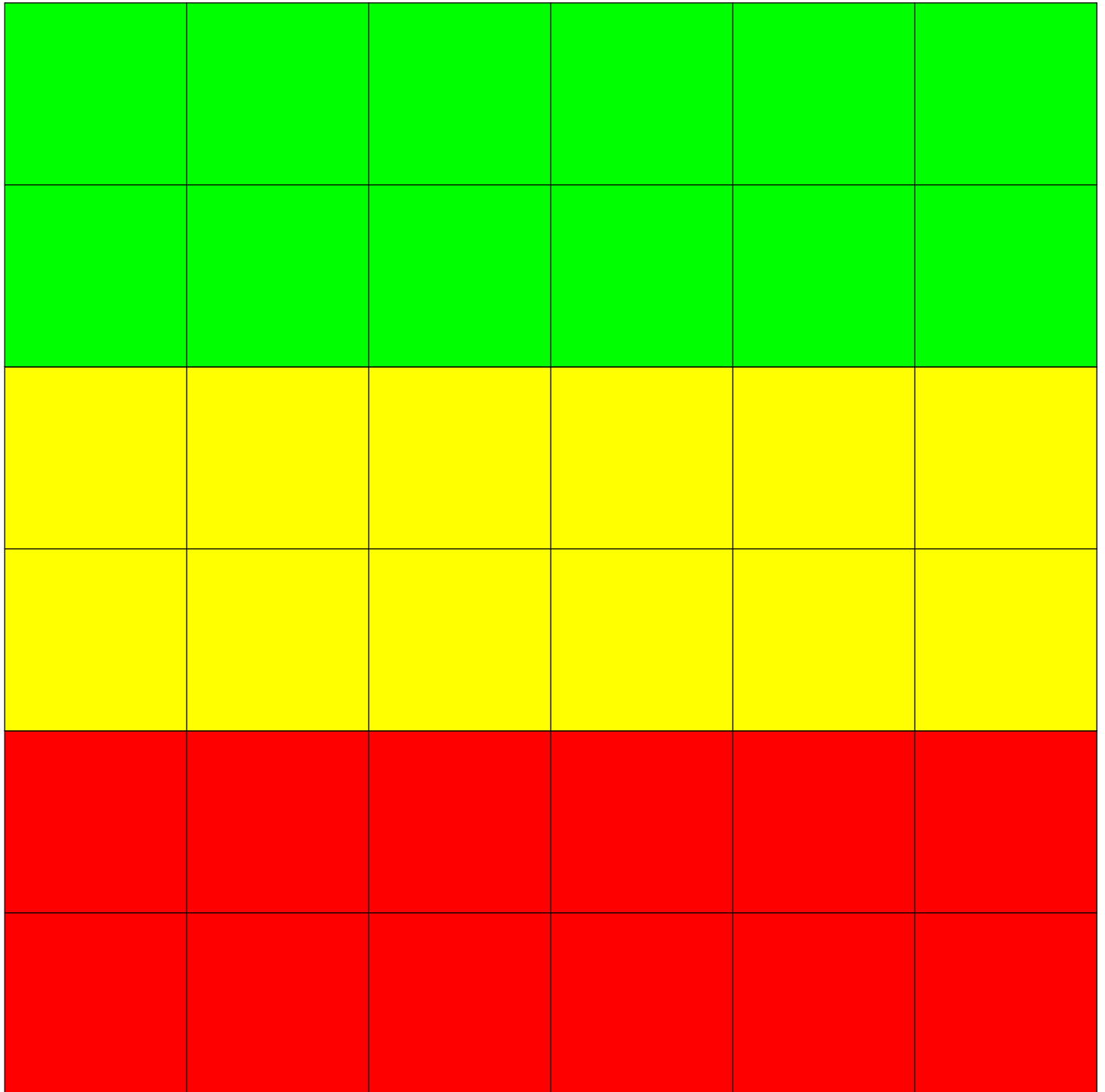
NUMBER:

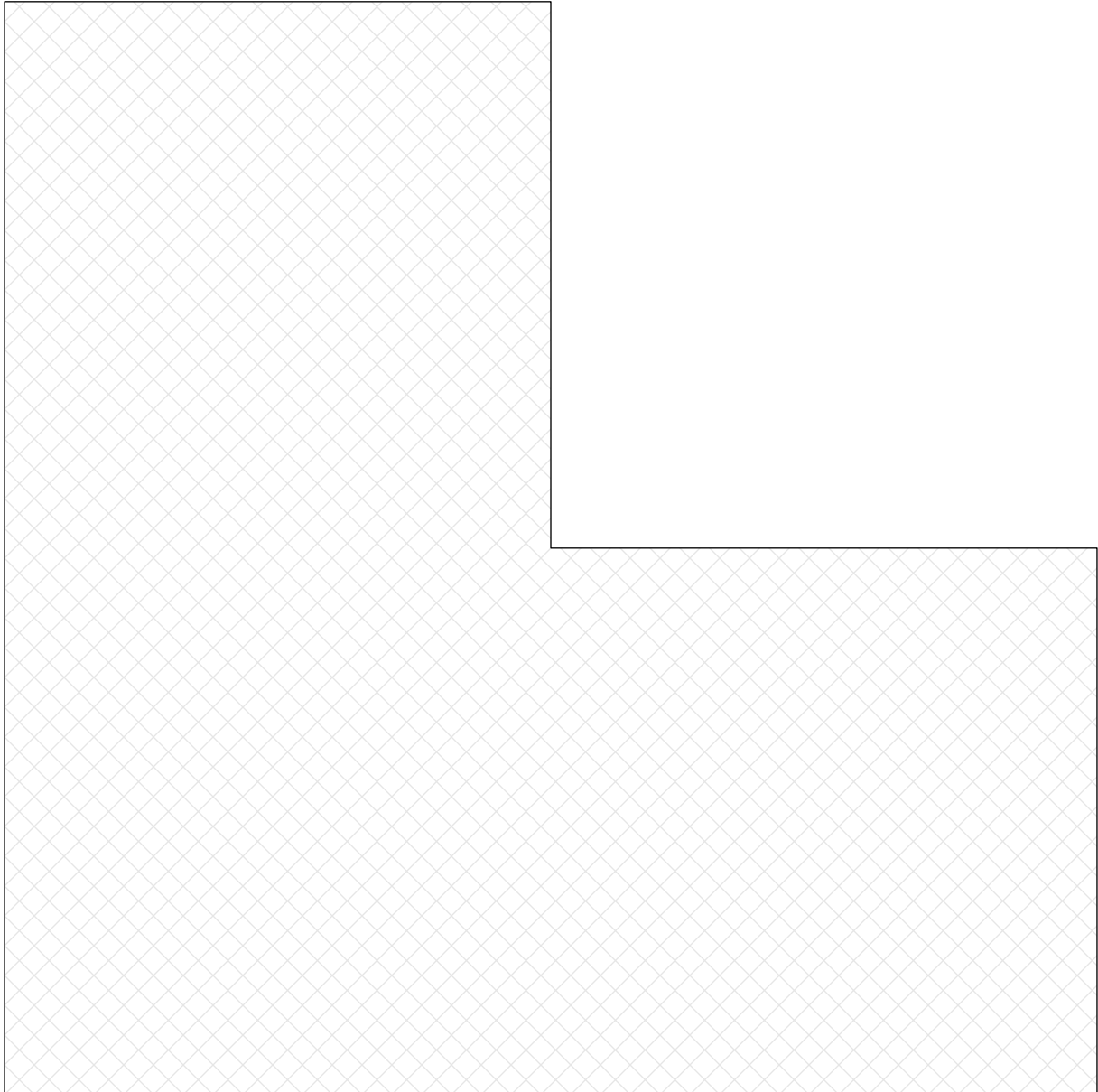
(b)

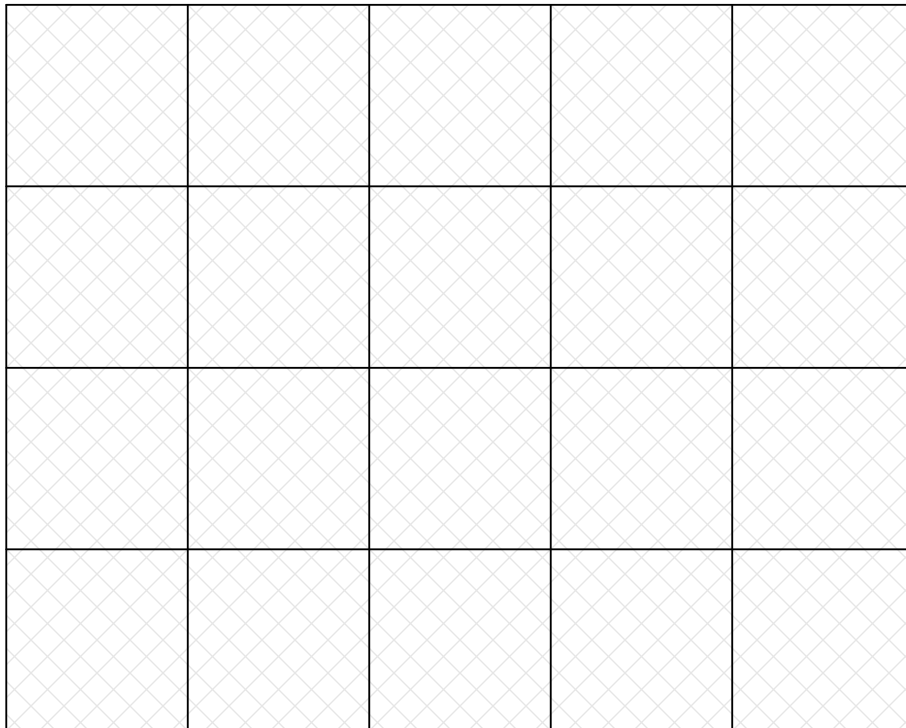
NUMBER:

(c)


NUMBER:







TEAM NUMBER 

SCHOOL NAME 

Station 1

Complete the worksheet and show it to the supervisor.

- (a) 0 2
- (b) 0 2
- (c) 0 2

Station 5

Complete the worksheet and show it to the supervisor.

- (a) 0 2
- (b) 0 2
- (c) 0 2

Station 2

Show your answer(s) to the supervisor.

- (a) 0 3
- (b) 0 3

Station 6

Show your answer(s) to the supervisor.

0 6

Station 3

Complete the worksheet and show it to the supervisor.

0 6

Station 7

Show your answer(s) to the supervisor.

- (a) 0 3
- (b) 0 3

Station 4

Show your answer(s) to the supervisor.

0 6

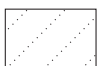
Station 8

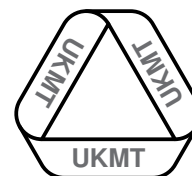
Show your answer(s) to the supervisor.

0 6

Circle the mark awarded for each question and cross out the others.

FINAL SCORE /48





SUPERVISOR

STATION 1

(a) 135 (b) 216 (c) 198

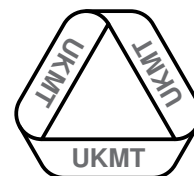
Ensure that the worksheet and any scrap paper are cleared away before the next team arrives.

**MARKS
TO AWARD**

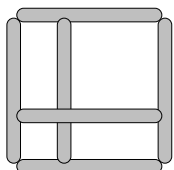
6 correct solution
4 two parts correct
2 one part correct
0 otherwise

RESOURCES

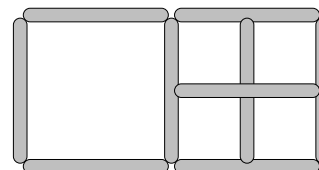
Question paper
Worksheet
Scrap paper

**SUPERVISOR****STATION 2**

(a) For example,



(b) For example,



Teams are required to set up the grid for part (a). The above are examples of solutions. In (a) you need to look for exactly three squares of different sizes. In (b) you need to look for exactly six squares. The edges of each square in both parts, for the answers to be acceptable, must be either a full stick or part of a stick. Please check each team's figures closely and judge the award of marks, or otherwise, by eye.

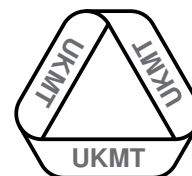
Ensure any evidence of each team's solutions and any scrap paper are cleared away before the next team arrives.

**MARKS
TO AWARD**

6 correct solution
3 one part correct
0 otherwise

RESOURCES

Question paper
17 sticks
Scrap paper



SUPERVISOR

STATION 3

| | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| A | | | | |
| B | | | | |

A correct solution is attained by a cross in the B3 cell only.

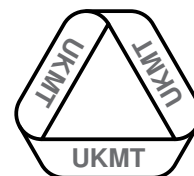
Ensure that the worksheet and any scrap paper are cleared away before the next team arrives.

MARKS
TO AWARD

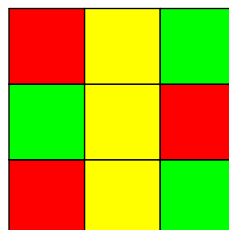
6 correct solution
0 otherwise

RESOURCES

- Question paper
- Worksheet
- Squared paper

**SUPERVISOR****STATION 4**

For example,



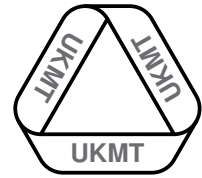
For the award of the marks please check carefully that each red card touches a yellow, each yellow card touches a green and each green card touches a red. The definition of "touches" here is that one square meets another edge to edge.

Ensure any evidence of each team's solution and any scrap paper are cleared away before the next team arrives.

| | |
|-----------------|---------------------------|
| MARKS | 6 correct solution |
| TO AWARD | 0 otherwise |

RESOURCES

Laminated question paper
Three red cards
Three yellow cards
Three green cards
Scrap paper



SUPERVISOR

STATION 5

(a) 16 (b) 24 (c) 128

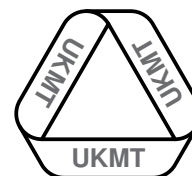
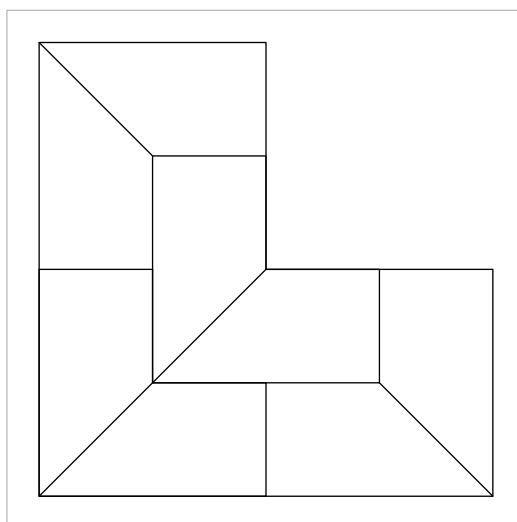
Ensure that the worksheet and any scrap paper used are cleared away before the next team arrives.

**MARKS
TO AWARD**

6 correct solution
4 two parts correct
2 one part correct
0 otherwise

RESOURCES

Question paper
Worksheet
Scrap paper

**SUPERVISOR****STATION 6**

Please check each team's L-shape for eight congruent quadrilaterals.
Judge the award of marks, or otherwise, by eye.

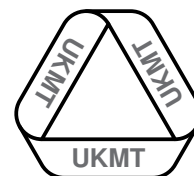
Ensure that any evidence of each team's solution and any scrap paper are cleared away before the next team arrives.

MARKS
TO AWARD

6 correct solution
0 otherwise

RESOURCES

Question paper
L-shape
Pencil
Ruler
Scrap paper



SUPERVISOR

STATION 7

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|--|---|---|----|---|---|--|--|----|--|---|---|----|---|---|--|--|--|---|--|---|----|----|---|---|--|--|----|--|---|---|---|----|---|
| <p>(a)</p> <table style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr><td></td><td></td><td style="border: 1px solid black; padding: 5px;">11</td></tr> <tr><td></td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">5</td></tr> <tr><td style="border: 1px solid black; padding: 5px;">13</td><td style="border: 1px solid black; padding: 5px;">3</td><td style="border: 1px solid black; padding: 5px;">7</td></tr> </table> <p style="margin: 0 10px;">or</p> <table style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr><td></td><td></td><td style="border: 1px solid black; padding: 5px;">13</td></tr> <tr><td></td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">3</td></tr> <tr><td style="border: 1px solid black; padding: 5px;">11</td><td style="border: 1px solid black; padding: 5px;">5</td><td style="border: 1px solid black; padding: 5px;">7</td></tr> </table> | | | 11 | | 2 | 5 | 13 | 3 | 7 | | | 13 | | 2 | 3 | 11 | 5 | 7 | <p>(b)</p> <table style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr><td></td><td></td><td style="border: 1px solid black; padding: 5px;">5</td></tr> <tr><td></td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">11</td></tr> <tr><td style="border: 1px solid black; padding: 5px;">13</td><td style="border: 1px solid black; padding: 5px;">3</td><td style="border: 1px solid black; padding: 5px;">7</td></tr> </table> <p style="margin: 0 10px;">or</p> <table style="display: inline-table; border-collapse: collapse;"> <tr><td></td><td></td><td style="border: 1px solid black; padding: 5px;">13</td></tr> <tr><td></td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">3</td></tr> <tr><td style="border: 1px solid black; padding: 5px;">5</td><td style="border: 1px solid black; padding: 5px;">11</td><td style="border: 1px solid black; padding: 5px;">7</td></tr> </table> | | | 5 | | 2 | 11 | 13 | 3 | 7 | | | 13 | | 2 | 3 | 5 | 11 | 7 |
| | | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 3 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 5 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 3 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 11 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

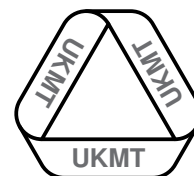
Ensure any evidence of each team's solutions and any scrap paper are cleared away before the next team arrives.

**MARKS
TO AWARD**

- 6** correct solution
- 3** one part correct
- 0** otherwise

RESOURCES





















- Laminated question paper
- Six blue cards
- Six yellow cards



SUPERVISOR

STATION 8

For example,

| | | | | |
|---|---|---|--|---|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Please check carefully that each row and each column of the grid contain an even number of counters. Also check that all 14 counters have been used.

Ensure any evidence of each team's solution is removed before the next team arrives.

| | |
|-----------------|---------------------------|
| MARKS | 6 correct solution |
| TO AWARD | 0 otherwise |

| |
|--|
| <p>RESOURCES</p> <p>Question paper</p> <p>Laminated grid</p> <p>14 counters</p> |
|--|