LeicesterHigh
SCHOOL
FOR GIRLS

Entrance Examination Specimen

Mathematics for Year 9 Entry

Time: 1 hour

You will need a ruler, but you must not use a calculator.

Answer as many questions as you can. Write your answers in the spaces provided and show all your working clearly.

Name:_____ **Age:** _____

Present School: _____

Mark: _____

1. (a) Calculate **9 × 28**

[1]

(b) What is **27 × 28**?

You can use part (a) to help you.

.....

[2]

(c) **600 ÷ 24 = 25**

Fill in the gap

600 ÷ ..... = 50

[1]

2. Write the four fractions below in order of size, smallest first

$\frac{3}{4}$ $\frac{1}{8}$ $\frac{1}{3}$ $\frac{3}{5}$

[2]

3.

(a) I am thinking of a number.
My number is a **multiple of 4**

Tick the true statement below.

My number must be even	My number must be odd	My number could be odd or even
☐	☐	☐

Explain how you know.

[2]

(b) I am thinking of a **different** number.
My number is a **factor of 20**

Tick the true statement below.

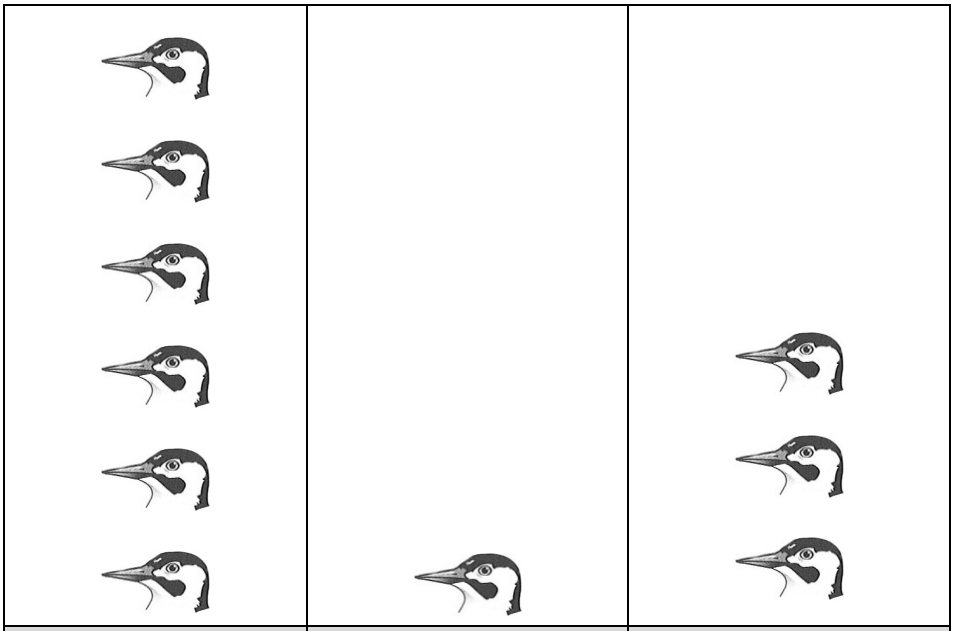
My number must be even	My number must be odd	My number could be odd or even
☐	☐	☐

Explain how you know.

[2]

4. Three different types of woodpecker live in Britain.

The pictogram shows information about the numbers of each type.



Type **A**	Type **B**	Type **C**
great spotted woodpecker	lesser spotted woodpecker	green woodpecker

Key: represents 10 000 woodpeckers

(a) Complete the table below to show the **percentages** of each type of woodpecker.

Type A	Type B	Type C
..... %	..... %	..... %

[2]

(b) The ratio of **type A : type B** woodpeckers is 6 : 1

What is the ratio of **type B : type C** woodpeckers?

..... : .....

[1]

5. Screenwash is used to clean car windows.

To use Screenwash you mix it with water.

Winter mixture	Summer mixture
Mix **1** part Screenwash with **4** parts water.	Mix **1** part Screenwash with **9** parts water.

(a) In **winter,** how much water should I mix with **150ml of Screenwash**?

..... ml

[2]

(b) In **summer,** how much Screenwash should I mix with **450ml of water**?

..... ml

[2]

(c) Is this statement correct?

> **25%** of **winter** mixture is **Screenwash**.

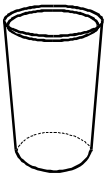
Tick (✓) Yes or No.

True ☐ False ☐

Explain your answer.

[1]

6. (a) A glass holds **225 ml**.



225 ml

An adult needs about **1.8 litres** of water each day to stay healthy.

How many glasses is that?
Show your working.

.....

[3]

(b) An adult weighs **80 kg**.
60% of his total mass is water.

What is the mass of this water?

.....kg

[2]

7. Look at the three expressions below.

$3k$	$4(k+2)$	k^2

When ***k* = 6**, what is the value of each expression?

$3k$. =..... $4(k+2)$ = ... k^2 =.....

[3]

When ***k* = -10**, what is the value of each expression?

$3k$ =..... $4(k+2)$ = ... k^2 =.....

[3]

8. (a) Some of the fractions below are **smaller than** $\frac{1}{9}$

Tick them.

☐ $\frac{1}{10}$ ☐ $\frac{4}{9}$ ☐ $\frac{1}{2}$ ☐ $\frac{1}{100}$ ☐ $\frac{1}{8}$

[1]

(b) To the nearest per cent, what is $\frac{1}{9}$ **as a percentage**?

Tick the correct percentage.

☐ 0.9% ☐ 9% ☐ 10% ☐ 11% ☐ 19%

[1]

(c) Complete the sentence below by writing a **fraction**.

$\frac{1}{9}$ is half of .....

[1]

9. (a) Simplify this expression fully

$$\frac{5a^2b}{10a}$$

[2]

(b) Multiply out the brackets and simplify this expression

$4 (x + 2) - 5 (x – 3)$

[3]

10. Solve these equations.

(a) $3y + 1 = 16$

$y =$ .....

[2]

(b) $18 = 4k + 6$

$k =$ .....

[2]

(c) $3p + 14 = 5p + 1$

$p =$ .....

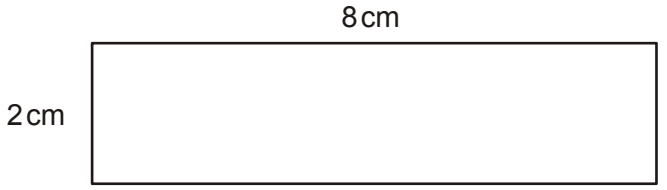
[3]

(d) $2(2n + 5) = 12$

$n =$ .....

[3]

11. Here is a rectangle.



Not drawn accurately

(a) A **square** has the **same area** as this rectangle.

What is the **side length** of this square?

..... cm

[1]

(b) A **different square** has the **same perimeter** as this rectangle.

What is the **side length** of this square?

..... cm

[1]

12. (a) In a magazine there are three adverts on the same page.

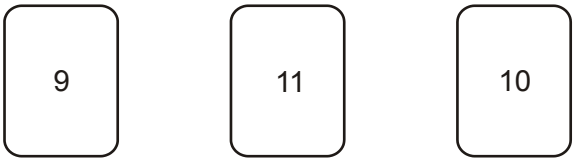
Advert 1 uses $\frac{1}{4}$ of the page
Advert 2 uses $\frac{1}{8}$ of the page
Advert 3 uses $\frac{1}{16}$ of the page

In total, what **fraction** of the page do the three adverts use?
Show your working.

.....

[2]

13. (a) Look at these three numbers.



Show that the **mean** of the three numbers is **10**

[1]

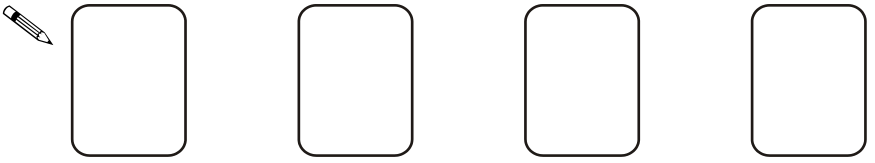
Explain why the **median** of the three numbers is **10**

[1]

(b) Four numbers have a mean of 10 and a median of 10, but **none** of the numbers is 10

What could the four numbers be?

Give an example.

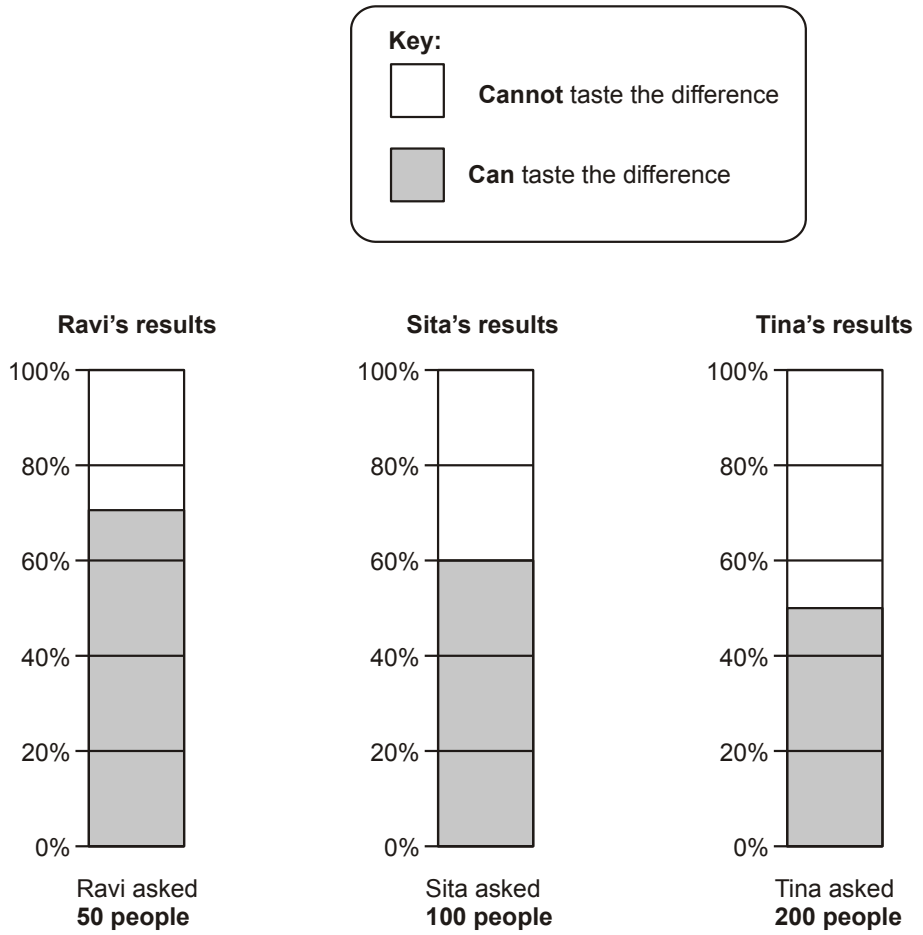


[2]

14. Wine gums are sweets that are made in different colours.

Pupils tested whether people can taste the difference between black wine gums and other wine gums.

The percentage bar charts show three pupils' results.



(a) Complete the table.

	Number of people who were tested	Number of people who **can** taste the difference	Number of people who **cannot** taste the difference
Ravi	50		
Sita	100		
Tina	200		

[3]

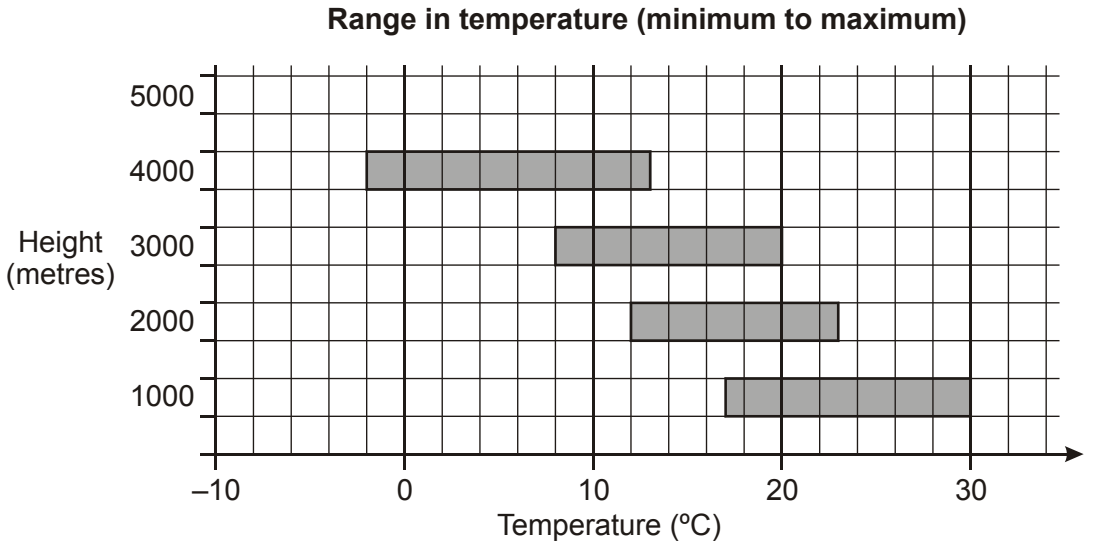
(b) Explain why **Tina's** results are likely to be **more reliable** than Ravi's or Sita's.

[1]

15. There are high mountains in Nepal.

At different heights, the temperature is different.

The graph shows information about temperatures in one month.



For example:

At 1000 metres, the maximum temperature is 30°C.

(a) At **3000** metres, what is the **minimum** temperature?

.....°C

[1]

(b) At **5000** metres, the minimum temperature is **–3°C**.

The **range** in temperature is **15°C**.

On the graph above, draw a bar to show this information.

[2]

16. Fred has a bag of sweets.

Contents
3 yellow sweets
5 green sweets
7 red sweets
4 purple sweets
1 black sweet

He is going to take a sweet from the bag at random.

(a) What is the **probability** that Fred will get a **black** sweet?

.....

[1]

(b) Write the missing **colour** in the sentence below.

The probability that Fred will get a ..... sweet is $\frac{1}{4}$

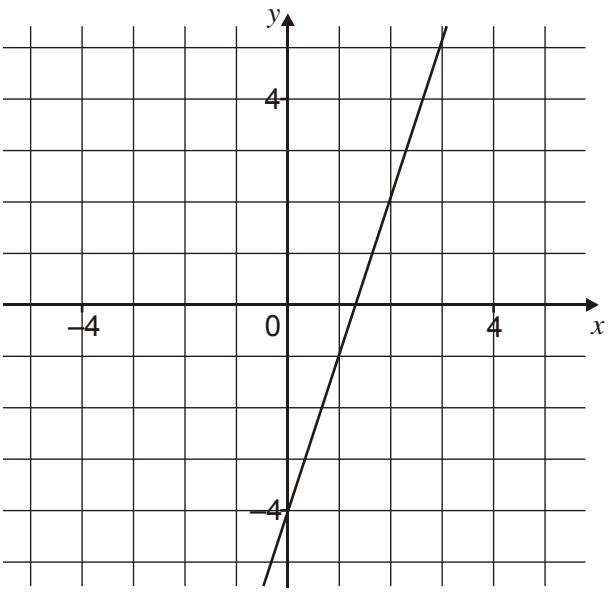
[1]

(a) What is the **probability** that Fred will get a **green or a yellow** sweet?

.....

[2]

17. The graph shows the straight line with equation $y = 3x - 4$



(a) A point on the line $y = 3x - 4$ has an ***x*-coordinate of 50**

What is the *y*-coordinate of this point?

.....

[2]

(b) A point on the line $y = 3x - 4$ has a ***y*-coordinate of 50**

What is the *x*-coordinate of this point?

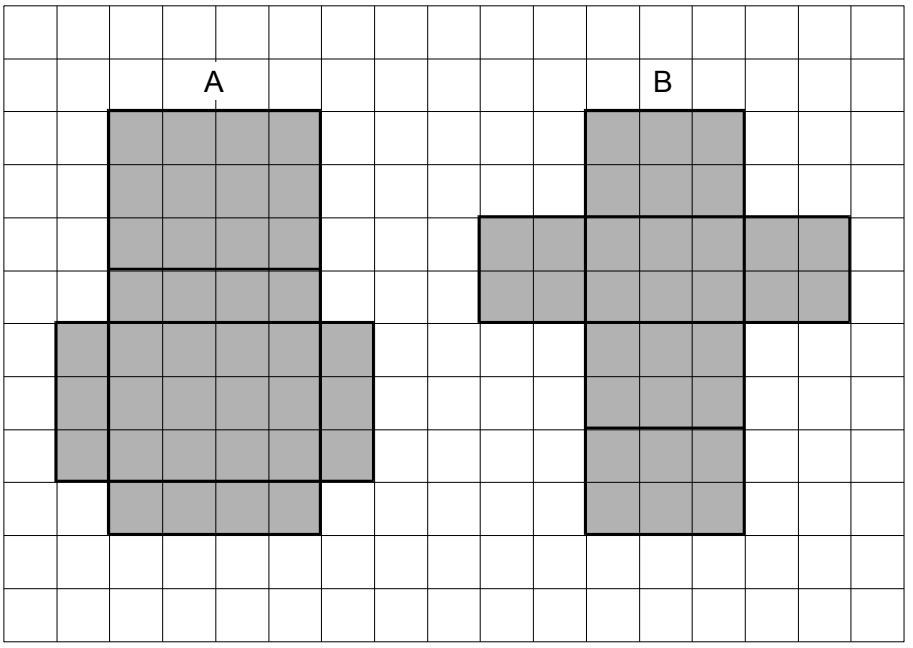
.....

[3]

(c) The gradient of the line is 3. On the graph, draw a different straight line with gradient 3

[1]

18. The squared paper shows the nets of cuboid A and cuboid B.



(a) Do the cuboids have the **same surface area**?

Show calculations to explain how you know.

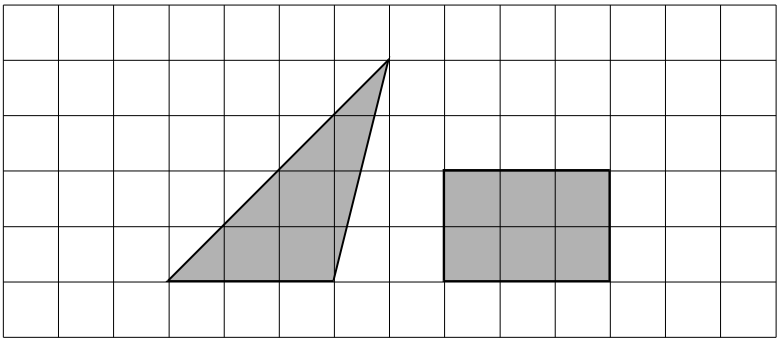
[2]

(b) Do the cuboids have the **same volume**?

Show calculations to explain how you know.

[3]

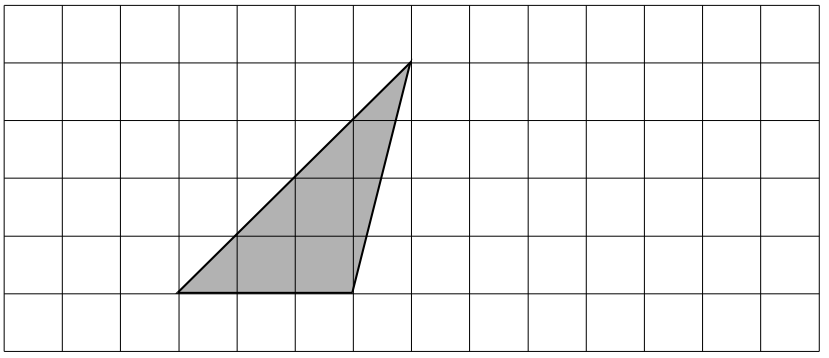
19. The shapes in this question are drawn on square grids.



(a) Show that the triangle and the rectangle have the **same area.**

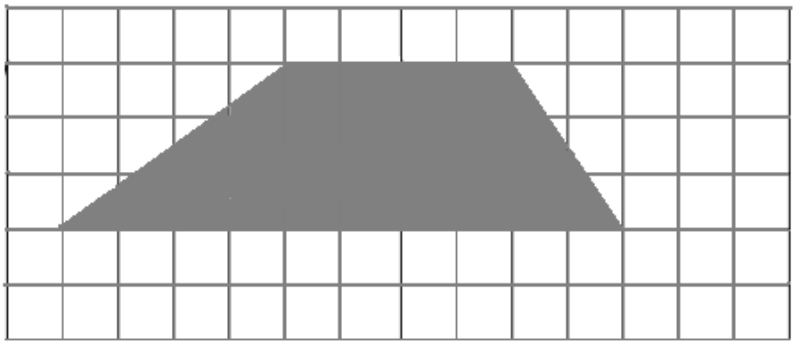
[2]

(b) On the grid below, draw a **parallelogram** that has the same area as the triangle. It must **not** have any right angles.



[2]

(c) What is the area of this trapezium?



.....

[3]

20. Rearrange the equations.

$b + 4 = a$ $b =$ .....

[1]

$4d = c$ $d =$ .....

[1]

$m - 3 = 4k$ $m =$ .....

[1]

$t^2 = 4s$

$s =$ .....

[2]

21. Look at these number cards.

0.2	**2**	**10**	**0.1**	**0.05**	**1**

(a) Choose two of the cards to give the **lowest possible answer**.
Fill in the cards below and work out the answer.

☐ **×** ☐ **=** .....

[2]

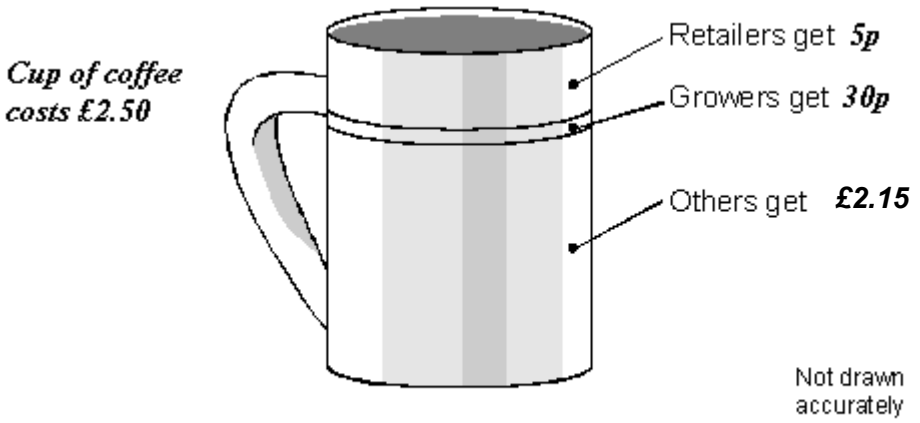
(b) Choose two of the cards to give the answer **100**

☐ **÷** ☐ **=** 100

[1]

22. A cup of coffee costs £2.50

The diagram shows how much money different people get when you buy a cup of coffee.



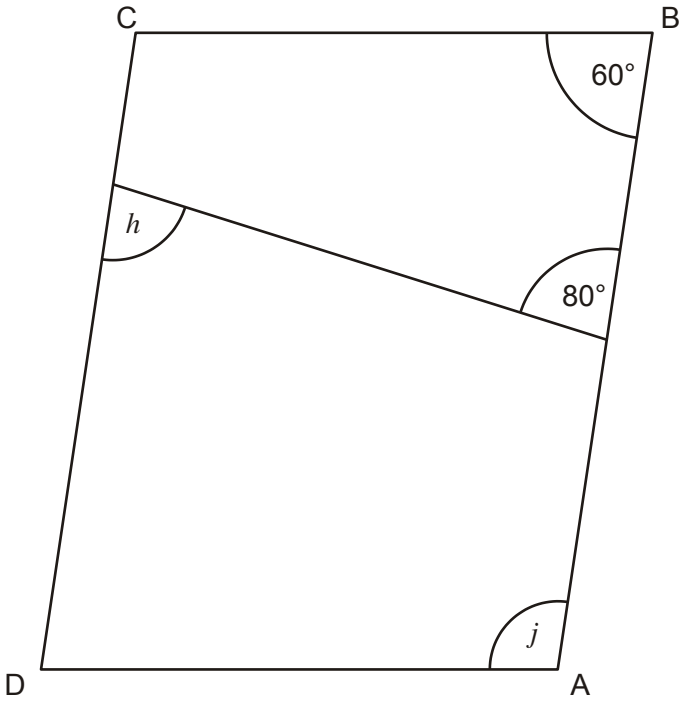
(a) Complete the table to show what **percentage** of the cost of a cup of coffee goes to retailers, growers and others.

Show your working.

Retailers	%
Growers	%
Others	%

[4]

23. ABCD is a **parallelogram**.



Not drawn accurately

Work out the sizes of angles *h* and *j*

Give reasons for your answers.

h = ...° because .....

.....

.....

.....

[2]

j = ...° because
.....

.....

.....

.....

[2]