LeicesterHigh
SCHOOL
FOR GIRLS

Entrance Examination Specimen

Mathematics for Year 8 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 workings clearly.

Name:_____ **Age:** _____

Present School: _____

Mark: _____

1. Pencils are bought in two ways, either 15p each or £3.12 for a box of 24.

a How much does it cost for 7 pencils bought individually?

£ _____ (2)

b If I buy 4 boxes of 24 pencils, how much change should I receive if I pay with a £20 note?

£ _____ (3)

c How much is saved by buying a box of 24 rather than buying 24 pencils individually?

£ _____ (3)

d A school requires enough pencils so that each of its 340 pupils can have a pencil each. How many boxes of 24 pencils should the school buy, and how many spare pencils will this leave?

Boxes _____

Spare _____ (3)

2. Calculate

a one third of £25.74

£ _____ (2)

b $\frac{3}{4}$ of 180°

_____ (2)

3.

a Ann and Ben share 28 sweets in the ratio 4 : 3
(Ann has 4 sweets for every 3 sweets that Ben has).
How many sweets do they each receive?

Ann _____ Ben _____ (3)

b A necklace is made from black and white beads in a ratio of 3 : 2 , in other words for every 3 black beads there were 2 white beads.

●●●○○●●●○○

If there are 80 beads altogether, how many beads are black?

_____ (2)

4. A square has a perimeter of 20 cm.

a Find the length of the side of the square.

Side = _____ cm (2)

b Calculate the AREA of the square.

Area = _____cm² (2)

5. It takes Margaret 45 minutes to cycle 9 km.

a How long would it take her to cycle 1 km at that speed?

_____ min (2)

b How far will she have travelled in one hour at that speed?

_____ km (2)

6. Write down all the factors of 28 and circle any which are prime numbers.

_____ (4)

7. a Show how you would work out a rough estimate of the product

375 x 23

and give your estimated answer.

Estimate _____ x _____ = _____ (3)

b Now work out the exact answer to 375 x 23

_____ (2)

c Amran wrote down the calculation:

$$\frac{6000 \times 20}{30} = 40$$

Her teacher looked at the answer and said it could not be correct.
Explain how her teacher knew the answer must be wrong.

_____

_____

(2)

8. Mrs Cook's supermarket basket contains:

1 loaf of bread costing 68p
1 packet of cheese costing £3.29
5 packets of crisps at 22p each
2 tins of soup at 39p each.

Calculate how much change she will receive if she pays with a £20 note.

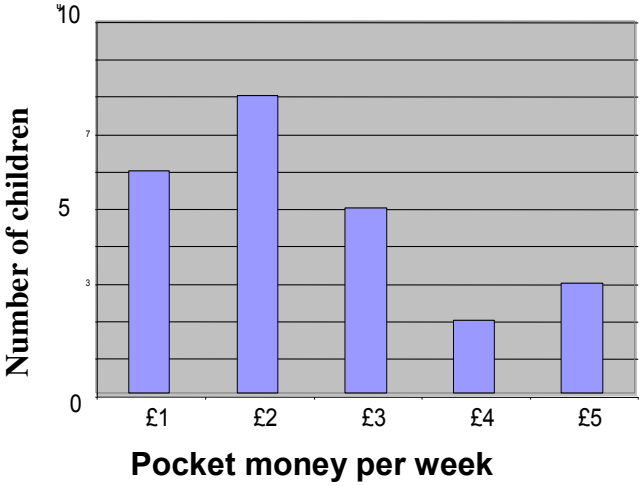
Change £ _____ (4)

9. a.

The bar a chart shows the results of a survey on the amount of pocket money given to 24 children.

a What is the mode?

£_____ (1)



b How many children have at least £3 per week pocket money?

_____ (2)

c Find out the total amount of money given to the children.

£_____ (2)

d A pie chart is drawn to show the same information.
Calculate the angle of the sector which represents the children who have £1 per week pocket money.

_____ (2)

9. A ball of string is 2 metres long. Pieces of length 30 cm are cut from the ball. How many whole pieces may be cut and what length is left over?

Number of pieces _____

Remaining length _____ (3)

10. a. Write the fraction $\frac{3}{5}$ as a decimal.

_____ (1)

b. $\frac{3}{5}$ of the pupils at a school stay for lunch.

If there are 750 pupils at the school, how many stay for lunch?

_____ (2)

11. If 25% of the cost of building a boat is for materials. Calculate the cost of the materials in a boat costing £6000 to build.

£_____ (2)

12. The temperature at noon in Leicester on the seven days of one week are shown in the table below

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
5°C	4°C	7°C	1°C	8°C	8°C	9°C

Calculate the mean (average) temperature,

_____ (3)

13. Using all the digits 5, 7, 8 and 2, once and only once, find two two-digit numbers which add together (e.g. 58 + 72 = 130) to make:

a. an odd answer,

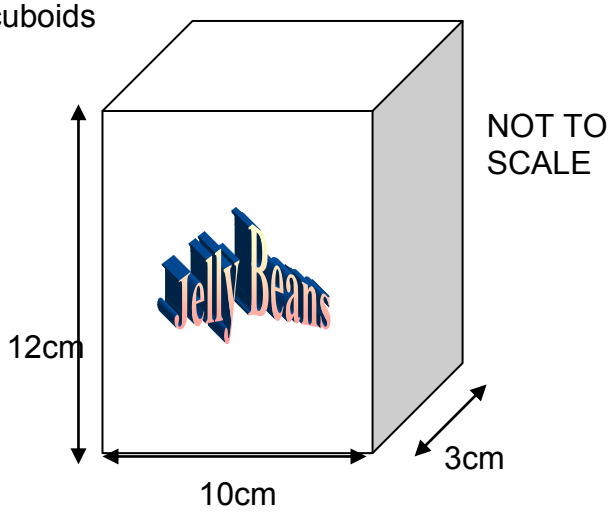
_____ (1)

b. The largest possible answer.

_____ (2)

14. Jelly beans are sold in boxes which are cuboids measuring 10 cm by 3 cm by 12 cm.

a. Find the volume of a box of jelly beans. Give the units for your answer.



NOT TO SCALE

_____ _____ (3)

The boxes are packed into cartons which are cuboids measuring 60 cm by 30 cm by 12 cm.

b. Find the number of boxes of jelly beans which may be packed into a carton.

_____ (3)

15. Solve these equations to find the value of the letter.

a. $5a = 15$

a =_____ (1)

b. $b - 7 = 26$

b =_____ (1)

c $\frac{c}{9} = 4$

c =_____ (1)

d $3x - 1 = x + 7$

x =_____ (3)

16. Each of these sequences follow a pattern. Write down the next two terms in sequence.

a. 3, 6, 9, 12, ____, ____

b. 2, 7, 12, 17, ____, ____

c. 1, 4, 9, 16, ____, _____

d. 29, 23, 18, 14, 11, ____, ____

(4)

17.

a. Find the largest 2-digit number which is neither prime nor divisible by 3 or 5.

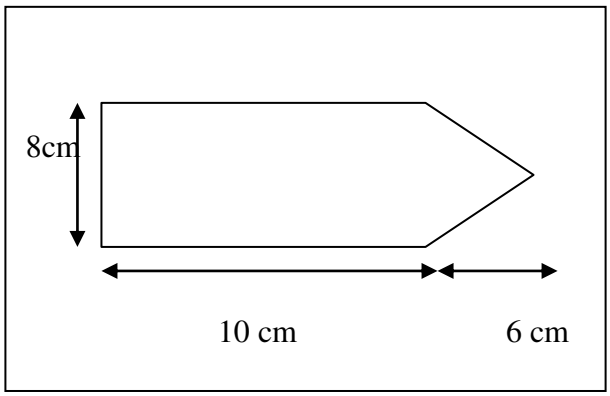
____ (2)

b. Find the smallest 3-digit number which is neither prime nor divisible by 2, 3 or 5.

_____ (2)

18.

NOT TO SCALE



This diagram shows a flag.

The design on the flag consists of a rectangle and a triangle.

a. Calculate the area of the design. Give the units of your answer.

_____ (4)

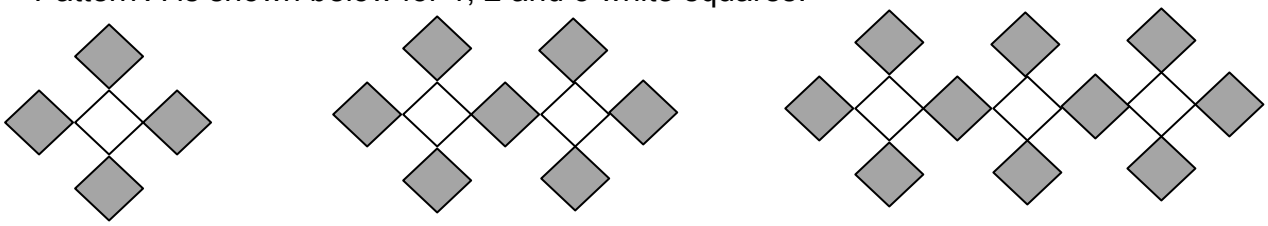
b. The two parts of the flag are to be **different** colours.
The design is to be red or blue or white.
The outer part is to be red or blue or green.
List the possible pairs of colours of the two parts of the flag.
Answer (b)

Design	Outer Part

(3)

19. Patterns are designed on a sheet of wallpaper so that every white square is surrounded by four coloured squares. Two of the possible arrangements are shown below.

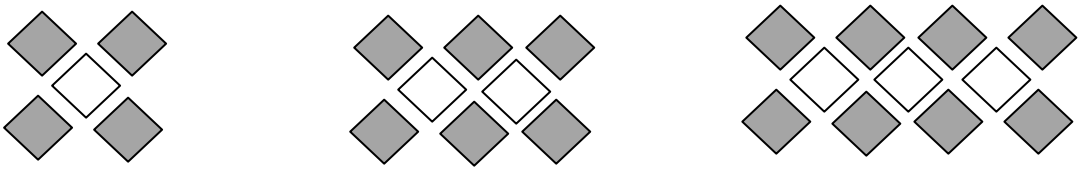
Pattern *A* is shown below for 1, 2 and 3 white squares.



a. How many coloured squares are needed when 6 white squares are used?

_____ (2)

Pattern *B* is shown below for 1, 2 and 3 white squares.



b. Twenty coloured squares are used in Pattern *B*. How many white squares are needed?

_____ (2)

c. Which pattern uses fewer coloured squares in general? Explain your answer.

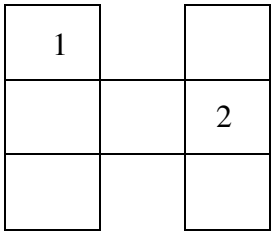
_____

_____

_____

_____ (2)

20. Place the numbers from 1 to 7 inclusive, one per square, in the diagram on the right so that the totals of the three numbers in the horizontal row and each of the two columns are the same. The numbers 1 and 2 must be in the position shown.



(3)