FOUNDED 1900

THE ENGLISH SCHOOL

A SECOND CENTURY OF EXCELLENCE

THE ENGLISH SCHOOL

ENTRANCE EXAMINATIONS 2013

MATHEMATICS FIRST FORM

Time allowed: 1 hour and 30 minutes

- Answer ALL questions.
- Show all necessary working on the question paper in the spaces provided and write your answers in the appropriate places.
- The marks for each question are given at the end of the question.
- There are 34 questions in this paper.
- The total number of marks is 100.
- If you cannot do a particular question, move to the next question without losing time.
- **CALCULATORS ARE NOT ALLOWED**.
- **DO NOT WRITE IN THE RIGHT HAND MARGIN**

Leave blank

1. Do the following calculations.
Give your answer as a fraction in its simplest form where necessary.

(a) $\left(6.2+5.8\right)\div\frac{2}{3}=$

Answer: …… **(2)**

(b) $\left(5\frac{1}{4}-3\frac{1}{5}\right)\div1\frac{1}{2}=$

Answer: …… **(2)**

(Total 4 marks)

Q2

2. Hugo the butcher bought 57kg of meat for €1026. How much did he pay per kg?

Answer: €…….. **(2)**

(Total 2 marks)

Q2

3. Round 5.465 to the nearest:

(a) unit

Answer: …… **(1)**

(b) hundredth

Answer: …… **(1)**

(Total 2 marks)

Q3

Leave blank

4. The ratio of red to blue beads in a jar is 7 : 13. If there are 84 red beads, how many blue beads are in the jar?

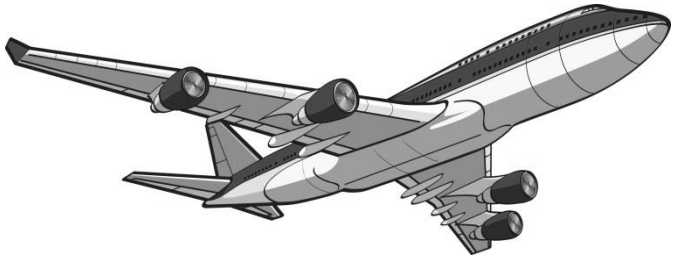
Answer: blue beads = …… **(2)**

(Total 2 marks)

Q4

5. The table shows the time difference in hours for various cities around the world compared with the time in the UK, which is Greenwich Meridian Time (GMT).

			GMT				
San Fransisco	*New York*	*Rio de Janeiro*	*London*	*Budapest*	*Moscow*	*Beijing*	*Sydney*
- 8 h	*- 5 h*	*- 3 h*	*0 h*	*+ 1 h*	*+ 3 h*	*+ 8 h*	*+ 10 h*



(a) A plane left London at 11.00 am on Saturday for an 11 hour flight to San Francisco. What was the time in San Francisco when it landed?

Answer: …… **(1)**

(b) A plane left London for Moscow at 10.00 pm on Sunday. It was 4.00 am on Monday in Moscow when it landed. How long was the flight?

Answer: …… **(1)**

(Total 2 marks)

Q5

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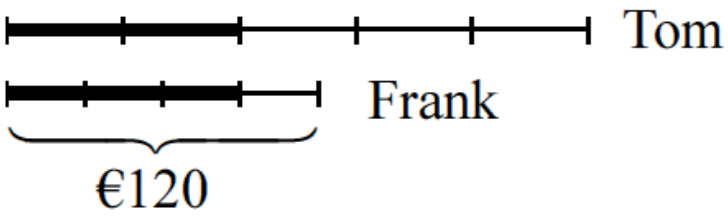
6. $\frac{2}{5}$ of Tom's money is the same as $\frac{3}{4}$ of Frank's money.



(a) If Frank has €120 in total, how much does Tom have?

Answer: € …… **(2)**

(b) What ratio is Tom's to Frank's money? Simplify your answer.

Answer: ……. : ……. **(2)**

(Total 4 marks)

Q6

7. The average age of the 11 members of a football team is 22 years.
When one member of the team was sent off, the average age of the rest of the team was 21 years.

How old is the player who was sent off?

Answer: …… years old. **(3)**

(Total 3 marks)

Q7

Leave blank

8. Athena has three cats.
Each cat has a different weight.
The first and second weigh 7 kg altogether.
The second and third weigh 8 kg altogether.
The first and third weigh 11 kg altogether.
What is the weight of each cat?

Answer: 1st cat : .....kg

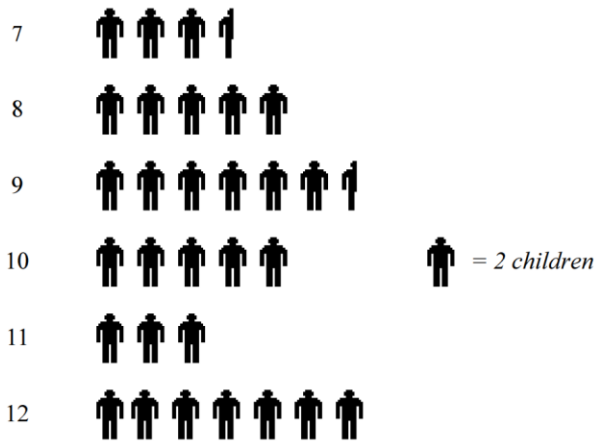
2nd cat : .....kg

3rd cat : .....kg **(3)**

(Total 3 marks)

Q8

9. The ages of the children that belong to a junior tennis club are illustrated in the pictogram.



How many children belong to the junior tennis club?

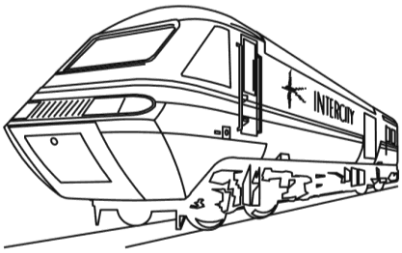
Answer: ..... children. **(2)**

(Total 2 marks)

Q9

Leave blank

10. A train travels a distance of 90 kilometres from A to B in one hour. Another train sets off at the same time and travels from B to A, taking two hours to complete the journey. How many kilometres from A did the two trains meet?



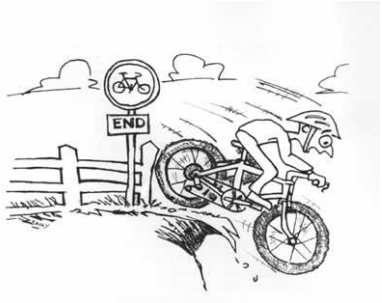
Answer: …… km **(2)**

(Total 2 marks)

Q10

11. The Council has laid $12\frac{1}{2}$ km of a cycle track, which is $\frac{5}{8}$ of the planned length.

(a) Find the length that the cycle track will have once it is completed.



Answer: …… km **(2)**

Next year, the Council plans to extend the cycle track by $2\frac{1}{4}$ times the original length.

(b) How long will the cycle track be then?

Answer: …… km **(2)**

(Total 4 marks)

Q11

Leave blank

12.

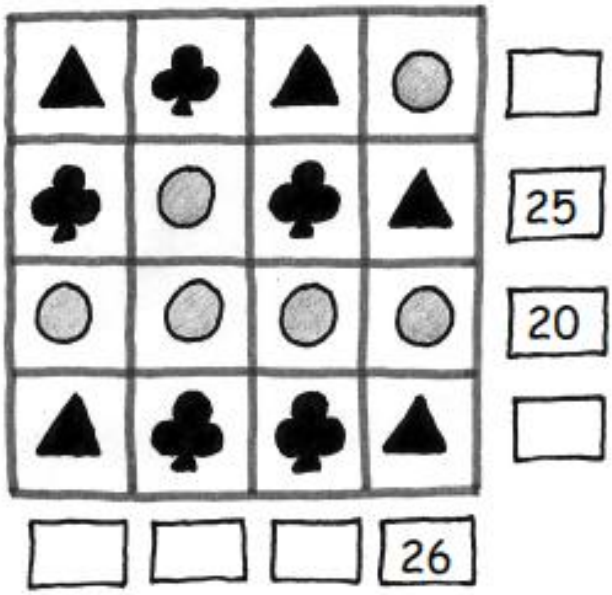
(a) You are given the equation

$$\frac{2}{*} - \frac{*}{5} = \frac{1}{15}.$$

The * symbol stands for the same whole number value.
Find its value.

Answer: * = …… **(1)**

(b) In the diagram below, each shape stands for a number.



The numbers shown are the sums of the four numbers in a row or a column.
For example, the sum of the numbers in the 2nd row is 25.

(i) Find the number that corresponds to each shape.

 = ……

 = ……

 = …… **(3)**

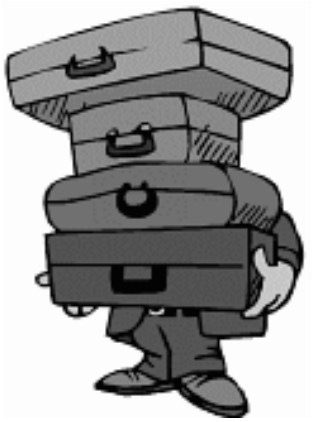
(ii) Find the remaining sums. Write your answers in the empty boxes above. **(1)**

Q12

(Total 5 marks)

Leave blank

13. When travelling by aircraft, passengers have a maximum allowable weight for their luggage. They are then charged €10 for every kilogram overweight. If a passenger carrying 40 kg of luggage is charged €50, how much would a passenger carrying 80 kg be charged?



Answer: € …… **(3)**

(Total 3 marks)

Q13

14. At a birthday party, half of the children drank only lemonade, a third of the children drank only cola, fifteen children drank neither, and nobody drank both.

How many children were at the party?

Answer: …… children. **(2)**

(Total 2 marks)

Q14

Leave blank

15. Three different positive whole numbers add to make sixteen. The larger number is the sum of the two smaller numbers. Write down the three possible solutions?

solution 1: …. , …. , ….

solution 2: …. , …. , ….

solution 3: …. , …. , …. **(2)**

Q15

(Total 2 marks)

16. Three pieces of ribbon were cut from a $16\frac{1}{5}$ m length. The first piece was 80 cm, the second piece was $1\frac{1}{2}$ m and the third piece was three times as long as the first and second pieces put together.

(a) What length of ribbon was cut off altogether?

Answer: …… m **(3)**

(b) What length of ribbon was left?

Answer: …… m **(1)**

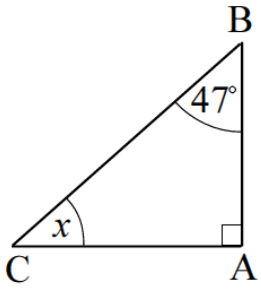
Q16

(Total 4 marks)

Leave blank

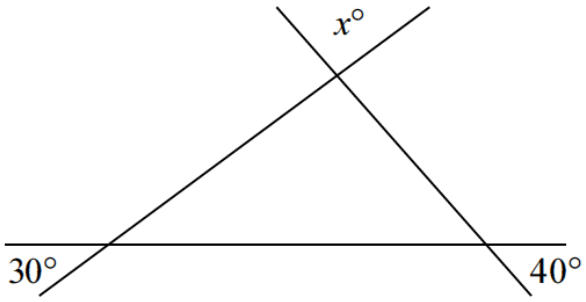
17. Calculate the sizes of the unknown angles. (*The diagrams are not accurately drawn*)

(a)



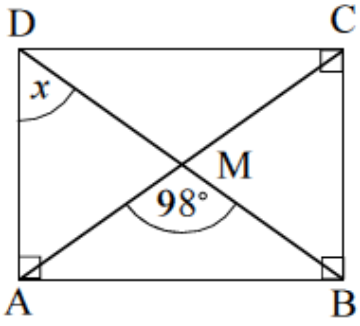
x = ……° **(1)**

(b)



x = ……° **(1)**

(c) ABCD is a rectangle.



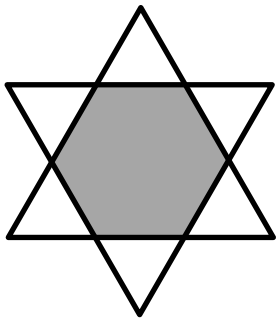
x = ……° **(2)**

Q17

(Total 4 marks)

Leave blank

18. Two congruent equilateral triangles, each with an area equal to 36 cm^2, are placed on top of each other so that they form a regular hexagonal overlap (shaded). Find the area of the hexagon. (*The diagram is not accurately drawn*)



Answer: …… cm^2 **(2)**

Q18

(Total 2 marks)

19. Stephanie put some 10 pence coins on the table.
One half of them were tails up.

Stephanie turned over two of the coins so that now one third of them were tails up.
How many coins did Stephanie put on the table?

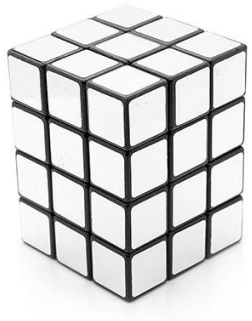
Answer: …… **(2)**

Q19

(Total 2 marks)

Leave blank

20. The square base of a solid wooden cuboid has 3 cm edges.
The height of the cuboid is 4 cm.
The outside of the cuboid is painted red.



If the cuboid is cut into 1 cm cubes, how many of the unit cubes will have:

(a) 3 red faces?

Answer: …… **(1)**

(b) 2 red faces?

Answer: …… **(1)**

(c) 1 red face?

Answer: …… **(1)**

(d) No red faces?

Answer: …… **(1)**

(Total 4 marks)

Q20

21. The ratio of the lengths of the two sides of a rectangle is 2 : 5.
The area of the rectangle is 360 cm^2.

What are the dimensions of the rectangle?

Answer: …… cm ×…… cm **(3)**

(Total 3 marks)

Q21

Leave blank

22. Calculate the following:

(a) $35.6-4\times3.15+0.75\times3=$

Answer: ……. **(2)**

(b) $3.7+(8.4\div7-0.25)\times8=$

Answer: ……. **(2)**

(Total 4 marks)

Q22

23. The original price of a holiday was increased by 25% and its new price is €690. What was the original price of the holiday?

Answer: € …… **(2)**

(Total 2 marks)

Q23

24. In my pocket I have eight coins made up of 1p, 2p and 5p pieces. The total amount in my pocket is 15p. How many of each coin do I have?

1p coins: ……

2p coins: ……

5p coins: …… **(2)**

(Total 2 marks)

Q24

Leave blank

25. The first four diagrams of a sequence are shown below.

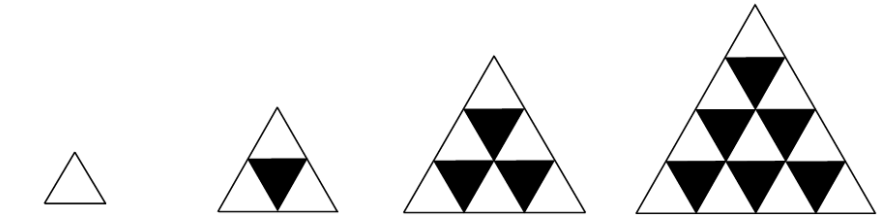


Diagram 1 *Diagram 2* *Diagram 3* *Diagram 4*

The table below shows the number of black and white triangles for the first three diagrams.

Diagram number	1	2	3	4	5
Number of white triangles	1	3	6		
Number of black triangles	0	1	3		
Total number of triangles	1	4	9		

(a) Complete the table. **(2)**

(b) What will be the total number of triangles in diagram 10?

Answer: ..... triangles. **(2)**

(c) A diagram has a total of 400 triangles. What is the number of this diagram?

Answer: *Diagram* ..... **(2)**

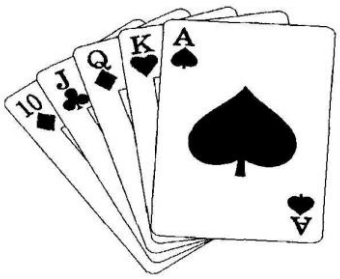
(Total 6 marks)

Q25

Leave blank

26. In a pack of 52 playing cards, there are 13 cards (Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen and King) in each of 4 suits: Diamonds (red), Hearts (red), Clubs (black) and Spades (black).

If you take a card from the pack at random, what is the probability that the card is:



(a) An Ace?

Answer: ..... **(1)**

(b) A red card?

Answer: ..... **(1)**

(c) Not an Ace?

Answer: ..... **(1)**

(d) An Ace or a red card?

Answer: ..... **(1)**

(Total 4 marks)

Q26

27. The sum of the digits of a 4-digit number is 15. The digits in the greatest and smallest place values are the same but are smaller in value than the two middle digits. The two middle digits have a difference of 1.

What could the 4-digit number be? Give two possible answers.

1st answer: .....

2nd answer: ..... **(2)**

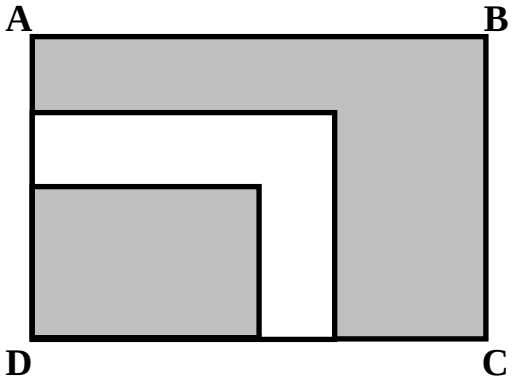
(Total 2 marks)

Q27

Leave blank

28.

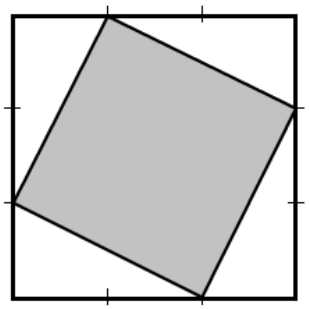
(a) The diagram shows 3 rectangles placed one on top of the other.
Each of the smaller rectangles has half of the area of the next.
(*The diagram is not accurately drawn*)



What fraction of rectangle **ABCD** is un-shaded?

Answer: ……. **(2)**

(b) In the diagram, the sides of the large square are 3 units long.
The sides of the large square have been divided into 3 equal parts and some of the dividing points have been joined up. (*The diagram is not accurately drawn*)



What is the area of the shaded square?

Answer: ……. **(2)**

(Total 4 marks)

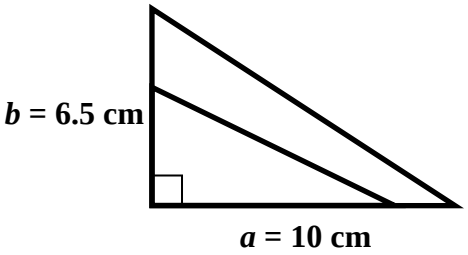
Q28

Leave blank

29. The perpendicular sides of a right-angled triangle are: ***a* = 10 cm**, ***b* = 6.5 cm**.

If we reduce side ***a*** by 20% and side ***b*** to $\frac{3}{5}$ of its length, a smaller right-angled triangle is formed.

(*The diagram is not accurately drawn*)



(a) Calculate the area of the smaller triangle.

Answer: …… cm^2 **(2)**

(b) What percentage of the area of the larger triangle is the area of the smaller triangle?

Answer: …… % **(2)**

(Total 4 marks)

Q29

30. To promote the launch of a new chocolate bar, a supermarket is offering the following ***"buy four, get one free"*** deal. If each chocolate bar costs 85 cents, how much would ten chocolate bars cost? Give your answer in euro.

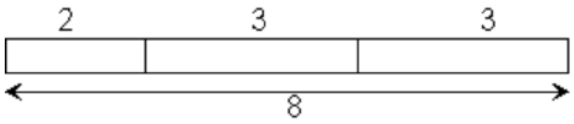
Answer: € …… **(2)**

(Total 2 marks)

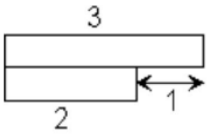
Q30

Leave blank

31. Using a 2 metre length and two 3 metre lengths, 8 metres can be measured.



It is possible to measure other lengths, for example, to measure 1 metre.



We can only measure lengths which are whole numbers.
Which of the lengths from 1 to 8 metres cannot be measured directly?

Answer: ……. **(1)**

(Total 1 mark)

Q31

32. Neal has €31. He puts this amount into 5 envelopes, seals the envelopes and writes on each how much money it contains. There is a different amount in each envelope.
Without opening any of the envelopes, Neal can pay any whole amount from €1 to €31.
How much money has he placed in each envelope?

1st envelope: € ……..
2nd envelope: € ……..
3rd envelope: € ……..
4th envelope: € ……..
5th envelope: € …….. **(2)**

(Total 2 marks)

Q32

Leave blank

33. In a box there are x apples. In a second box there are 7 apples more than in the first box. In a third box there are 5 apples fewer than in the first box.

(a) How many apples are in the second and third box?

First box : x apples.

Second box: ……. apples.

Third box : ……. apples. **(1)**

(b) How many apples are in the 3 boxes altogether?

Answer: …… apples. **(1)**

(c) How many apples are in the first box if there are 77 apples in all 3 boxes?

Answer: …… apples. **(2)**

(Total 4 marks)

Q33

34. A student has an average score of 85% after completing four tests.
What is the lowest possible percentage score in any one of the tests?

Answer: …… **(2)**

(Total 2 marks)

Q34

TOTAL FOR PAPER: 100 MARKS

END