



FOUNDED 1900

**THE ENGLISH SCHOOL**  
A SECOND CENTURY OF EXCELLENCE

**THE ENGLISH SCHOOL**

**ENTRANCE EXAMINATIONS 2012**

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 28 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**

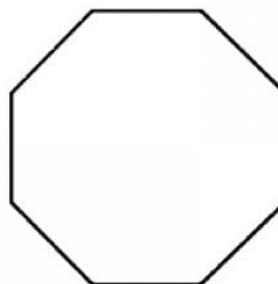
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1.

- (a) The sides of a triangle are 2.3 cm, 31 mm and 0.018 m long.  
What is the perimeter of the triangle? Give your answer in mm.

Answer: ..... mm (2)

- (b) The perimeter of a regular octagon is 5.44 cm.  
What is the length of each side? (*The diagram is not accurately drawn*)



Answer: ..... cm (2)

( Total 4 marks )

Q1

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2. Round 7812529 to the nearest:

- (a) Thousand

Answer: ..... (1)

- (b) Million

Answer: ..... (1)

( Total 2 marks )

Q2

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3.

(a) If 3.5 times a number is  $21\frac{7}{8}$ , what is the number?

Answer: ..... (2)

(b) In a Canadian city, 80% of the population speaks English and 70% speaks French. Every person can speak either French or English.

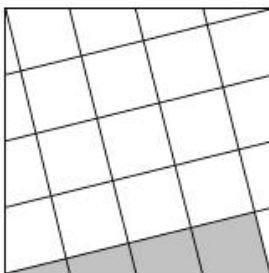
What percentage of the population can speak both languages?

Answer: ..... % (1)

( Total 3 marks )

Q3

4. The sides of a square are each divided into four equal parts. Some of the points are joined up as shown in the diagram. What fraction of the area of the whole square is the area of the shaded part? (*The diagram is not accurately drawn*)



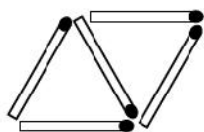
Answer: ..... (2)

( Total 2 marks )

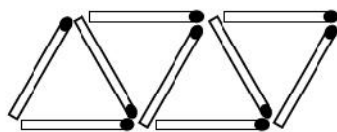
Q4

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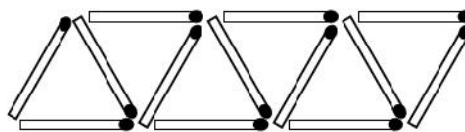
5. Patterns of triangles are made using sticks. The first three patterns are drawn below.



pattern 1



pattern 2



pattern 3

(a) How many sticks has Pattern 4?

Answer: ..... sticks (2)

(b) A pattern needs 101 sticks. What is the number of this pattern?

Answer: pattern ..... (2)

( Total 4 marks )

Q5

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6. Jim won the lottery. He spent two thirds of his winnings on a very expensive house. Then he spent two thirds of what he had left on a boat. He spent his last €200000 on a sports car.

How much did Jim win on the lottery?

Answer: € ..... (2)

( Total 2 marks )

Q6

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7. In a school with 900 pupils, the ratio of boys to girls is 11 : 14 and the ratio of teachers to pupils is 2 : 45.

(a) How many teachers are in the school?



Answer: ..... teachers (2)

(b) How many girls and how many boys are in the school?

Answer: ..... girls

Answer: ..... boys (3)

( Total 5 marks )

Q7

8. Dad can dig the garden in 2 hours.  
His elder son, Benny, can dig the garden in 3 hours.  
His younger son, Charlie, can dig the garden in 6 hours.  
If they all worked together, how long would it take the three of them to dig the garden?

Answer: ..... (2)

( Total 2 marks )

Q8

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9. Do the following calculations.  
Give your answer as a fraction in its simplest form.

(a)  $2\frac{1}{2} \div \left(6\frac{1}{4} - 2\frac{1}{5}\right) =$

Answer: ..... (2)

(b)  $\left[3\frac{4}{5} \times \frac{1}{2} - (2.65 - 1.55)\right] \div \frac{3}{2} =$

Answer: ..... (3)

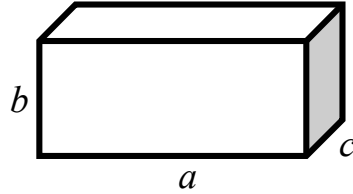
( Total 5 marks )

Q9

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10. Here is some information about the dimensions of a cuboid made of gold:

$$a = 50 \text{ cm, } b \text{ is } 40\% \text{ of } a, \quad c = \frac{1}{2} \text{ of } b.$$



(a) Calculate the volume of the cuboid in  $\text{m}^3$ .

Answer: .....  $\text{m}^3$  (3)

(b) Calculate the mass in kg of the cuboid if  $1 \text{ m}^3$  of gold has a mass of 19300 kg.

Answer: ..... kg (1)

( Total 4 marks )

Q10

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- 11.** Town A is 260 km from town B.  
Cindy leaves from town A at 08:00 and drives at a steady speed of 40 km per hour towards town B.  
Dan leaves from town B at 10:00 and drives at a steady speed of 80 km per hour towards town A.

**(a)** How far from town A is Cindy at 10:00?

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

**(b)** At what time will they meet each other?

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

**(c)** How far from town A will they meet each other?

Answer: ..... km **(2)**



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(d) At what time will they reach their destinations?

Cindy will arrive at: ..... (1)

Dan will arrive at: ..... (2)

( Total 8 marks )

Q11

12. A beekeeper had three beehives. She collected  $2\frac{4}{5}$  kg of honey from one of the beehives and 3.3 kg of honey from another. If she collected  $9\frac{7}{20}$  kg of honey altogether, how many kg of honey did she collect from the third beehive?



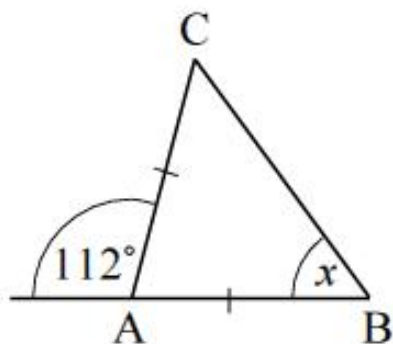
Answer: ..... kg (3)

( Total 3 marks )

Q12

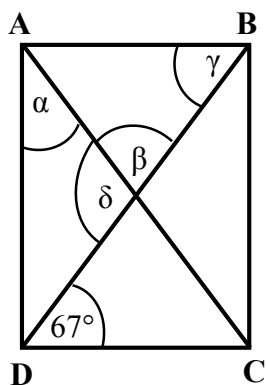
13. Calculate the sizes of the unknown angles. (*The diagrams are not accurately drawn*)

(a)



$x = \dots\dots\dots^\circ$  (1)

(b) ABCD is a rectangle.



$\alpha = \dots\dots\dots^\circ$  (1)

$\beta = \dots\dots\dots^\circ$  (1)

$\gamma = \dots\dots\dots^\circ$  (1)

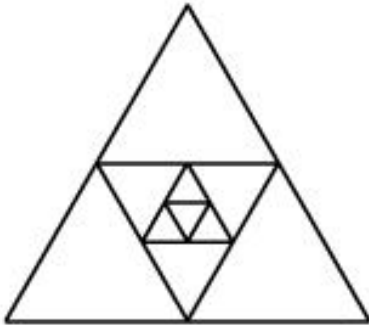
$\delta = \dots\dots\dots^\circ$  (1)

( Total 5 marks )

Q13

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14. Four equilateral triangles have been drawn, one inside the other. If the area of the innermost, smallest triangle is  $1 \text{ cm}^2$ , what is the sum of the areas of the four triangles?  
 (The diagram is not accurately drawn)

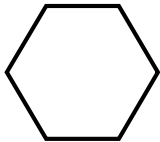




Answer: .....  $\text{cm}^2$  (2)

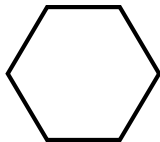


( Total 2 marks )

Q14

15. The following question is on pattern blocks.

(a) If  +  = 1, then  = ?

Answer: ..... (1)

(b) If  +  = 1, then  = ?

Answer: ..... (2)

( Total 3 marks )

Q15

Leave blank

16. This is what food costs at Franco's café:  
One pizza and one juice cost €4.  
Two pizzas and two salads cost €9.  
One salad and two juices cost €2.

*Franco's*



- (a) What do you have to pay in total for one pizza, one salad and one juice?

Answer: € ..... (2)

- (b) What does each item cost on its own?

Pizza: € .....

Salad: € .....

Juice: € ..... (2)

( Total 4 marks )

Q16

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17. You are given the following fraction.

$$\frac{1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10}{2^{10}}$$

$$[2^{10} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2]$$

What is the denominator of this fraction when it is simplified as far as possible?

Answer: ..... (2)

( Total 2 marks )

Q17

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18.

(a) What is this number?

$$2 \times 1000000 + 5 \times 10000 + 8 \times 1000 + 4 \times 10 + 2 \times 1 =$$

Answer: ..... (1)

(b) Calculate the following:

(i)  $60 \times 15 \div 3 - 8 \times 25 =$

Answer: ..... (1)

(ii)  $200.8 - 4 \times 24.2 + 396 =$

Answer: ..... (1)

( Total 3 marks )

Q18

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19. The length of a rectangle is 30cm and its width is 20 cm.  
 The length of a second rectangle is 110% of the length of the first rectangle.  
 The width of the second rectangle is 1.1 times the width of the first rectangle.  
 Find the area of the second rectangle in  $\text{cm}^2$ .

Answer: .....  $\text{cm}^2$  (3)

( Total 3 marks )

Q19

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20. The pages of Jack's book are numbered 1, 2, 3, ... etc. 333 digits have been used in order to number the pages of this book.



- (a) How many digits have been used in order to number the first 99 pages?

Answer: ..... digits (2)

- (b) How many pages does the book have?

Answer: ..... pages (2)

- (c) How many times has the digit 3 been used?

Answer: ..... times (2)

( Total 6 marks )

Q20

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21. The purity of gold is measured in 24ths.  
For example, a 5-carat gold ring means that five 24ths ( $\frac{5}{24}$ ) of its mass is pure gold.

How much is the mass of pure gold in an 8-carat gold ring which weighs  $2\frac{2}{3}$  g?


Answer: ..... g (2)

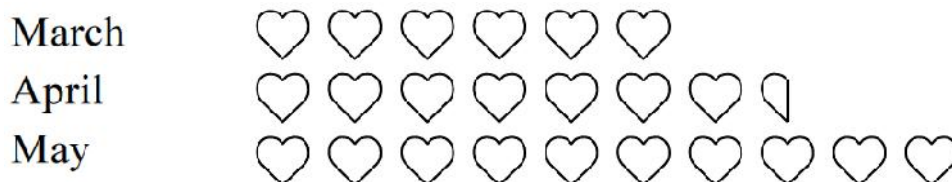
( Total 2 marks )

Q21

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22. The pictogram shows the number of weddings in a certain city during the spring of 2011.

Each  = 60 weddings.



Calculate the average number of weddings per month.

Answer: ..... (3)

( Total 3 marks )

Q22

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23. Three horses, ①, ② and ③, are running in a race.



(a) How many different ways are there for the horses to finish in 1st, 2nd and 3rd places?

Answer: ..... ways (2)

(b) If each of the different ways has an equal chance of happening, what is the probability of ③ finishing 1<sup>st</sup>, ① finishing 2<sup>nd</sup> and ② finishing 3<sup>rd</sup>?

Answer: ..... (1)

Five horses, ①, ②, ③, ④ and ⑤, are running in another race.  
There are 120 possible different ways in which the five horses can finish.

(c) If each of the different ways has an equal chance of happening, what is the probability of ③ finishing 1<sup>st</sup>, ① finishing 2<sup>nd</sup> and ② finishing 3<sup>rd</sup>?

Answer: ..... (2)

( Total 5 marks )

Q23

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24. In a sale the price of a television was reduced by 10%.  
Later in the sale the price of the television was reduced by a further 10%.  
The television now costs €243.  
What was its original price?

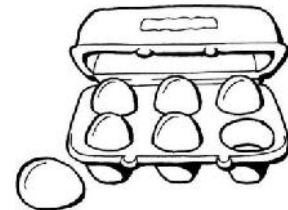


Answer: € ..... (3)

( Total 3 marks )

Q24

25. Mrs Jane spent exactly €1 on 10 eggs for her shop.  
Large eggs cost her 50 cents each.  
Medium eggs cost her 10 cents each.  
Small eggs cost her 5 cents each.  
For two of the sizes, she bought the same number of eggs.



How many of each size did she buy?

Small eggs: ..... (1)

Medium eggs: ..... (1)

Large eggs: ..... (1)

( Total 3 marks )

Q25

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26.

(a) Write down the lowest common multiple of 6 and 10.

Answer: ..... (1)

(b) The combined ages of the four members of a family is 70 years. Mum is 6 times as old as her son and 10 times as old as her daughter. Dad is 2 years older than Mum.

How old is Dad?

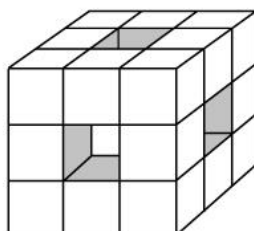
Answer: ..... years old (2)

( Total 3 marks )

Q26

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27. Imagine a cube built from 27 small 1 cm cubes. The middle cube in each face is removed and so is the small cube at the centre of the large cube.



(a) How many 1 cm cubes are removed altogether?

Answer: ..... cubes (1)

(b) What is the total surface area of the remaining solid?

Answer: .....  $\text{cm}^2$  (3)

( Total 4 marks )

Q27

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28.

- (a) Ben has a briefcase that can only be opened using the correct combination of 3 digits in the correct order. Ben tries the following 3 digits:

**1 5 9**, but one digit is wrong.

**7 5 8**, but one digit is wrong.

**7 4 9**, but one digit is wrong

What is the correct combination?

Answer: ..... (2)

- (b) Ben had to make a 4-digit number, choosing from the digits 1, 2, 3, 4, 5 and 6. He was allowed to use a digit more than once. Ben wrote his number on a piece of paper and put it in his pocket. The rest of the class had to guess Ben's number.

The first suggestion was 4215. Ben said that two digits were correct but only one of them was in the correct place-value column.

The second suggestion was 2365. Ben said that again two digits were correct but only one of them was in the correct place-value column.

The third suggestion was 5525. This time Ben said that no digits were correct.

Ben then gave them a clue. He said that the number was odd.

Which is Ben's number?

Answer: ..... (3)

( Total 5 marks )

Q28

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END

TOTAL FOR PAPER: 100 MARKS