ENTRANCE EXAMINATIONS 2005

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.

- 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.**

1. Circle the number which is closest to number **one.**

$$0.99 \qquad \frac{9}{10} \qquad 1.01 \qquad \frac{999}{1000} \qquad 99\%$$

(1 mark)

2. Write down the following numbers:
   a) 57.0196 correct to the nearest thousandth   ………………………….
   b) 23420.59 correct to the nearest thousand   ………………………….

(2 marks)

3. Calculate the value of each letter and write the letters in order starting from the smallest one.
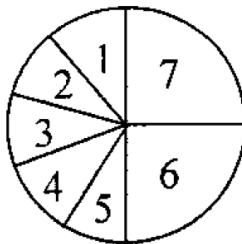
   A. $1\frac{1}{2} - \frac{2}{3}$ **B.** $(14 \times 5 + 5)\%$ **C.** $\frac{5 - 4 \div 4}{5}$

Answer: ……………. , ………………. ,……………..
(4 marks)

4. Half the circle is divided into 5 equal parts numbered 1 to 5. The other half of the circle is divided into two equal parts numbered 6 and 7.

What percentage of the circle is represented by the **odd** numbers?

Answer: ……………….%
(3 marks)

2

5. Calculate the following and give your answers in the units given.

a) 0.1 L + 550 ml =   …………………………………………ml

b) 1 kg - 1 g =   …………………………………………kg

c) 1 km + 1m + 1cm + 1mm =   …………………………………………m

(3 marks)

6. A bag contains 3 red balls, 4 green balls and 5 blue balls.

a) What fraction of the balls are not red?

Answer: ………………….

b) How many balls do I need to add in order to make the probability to pick a green ball to be equal to $\frac{1}{2}$.
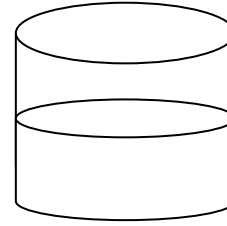
Answer: ………………….

(3 marks)

7. In a yard there are 14 rows of orange trees, 5 rows of mandarin trees and 11 rows of lemon trees, with the same number of trees on each row. Find how many trees there are all together if there 258 more orange trees than lemon trees.

Answer: ……………….trees

(3 marks)

3

8. A cylinder is half full with water. When we add another 810 ml of water $\frac{4}{5}$ of cylinder now become full.

a) Find the volume of the cylinder in cm^3.

Answer: ………………cm^3

(3 marks)

b) Given that the cylinder is full of water many full glasses of water can this amount of water fill up, given that each glass holds $\frac{1}{4}L$ of water?

Answer: ……………….

(2 marks)

9. A tailor bought 42.3 metres of fabric to make some suits. For each suit he needs 2.35 m.

a) What price must he sell each suit for in order to receive a total of € 1350?

Answer:€ ……………….

(3 marks)

b) If each suit costs € 60 for the both fabric and labour costs, what percentage profit does the tailor have?

Answer: ……………….%

(1 mark)

4

10. Twenty children, boys and girls, bought 20 biscuits. Each boy ate 2 biscuits and each girl ate half a biscuit. There was 1 biscuit left over. How many boys were there?

Answer: ………………. boys

(3 marks)

11. Mr Nikos sold 2 bags of beans for € 0.60 per kilo and received € 74.40 .
The second bag had 16 kg less than the first bag.
How many kg of beans does each bag have?

Answer: Bag 1:……………….

Bag 2 :……………….

(3 marks)

12. Anna writes a random two digit number.
   a) What is the probability that the number is greater than 46?

Answer: ……………….

   b) What is the probability that the number is smaller than 34?

Answer: ……………….

(3 marks)

5

13. On an electric sign there are 3 lights flashing. One red, one yellow and a blue. The red one flashes every 10 seconds, the yellow light every 15 seconds and the blue one every 18 seconds. The 3 lights flash together at 9.00pm.
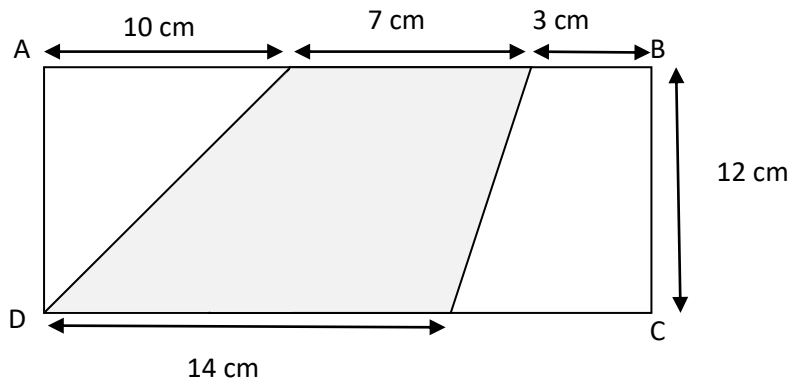
How many times will all 3 lights flash at the same time between 9.00pm and 10.00 pm included?

Answer: ………………

(4 marks)

14. For a TV worth € 400, there was a € 48 discount. If the percentage of the discount is constant, how much did Mrs Georgia pay for her washing machine, whose original price was € 250?
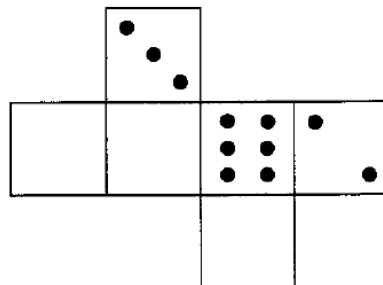
Answer:€ ………………

(3 marks)

15. The shape ABCD is a rectangle. (The diagram is not drawn accurately)

Find the area of the shaded section.

Answer: ……………….cm^2

(3 marks)

16. The following net when folded can make a die. Complete the missing dots so that opposite sides have a sum of 7.

(2 marks)

7

17. The temperature in Troodos during the afternoon was $-4°C$. At night it reduced by $5°C$, in the morning it increased by $3°C$ and then at lunchtime it increased by $7°C$.
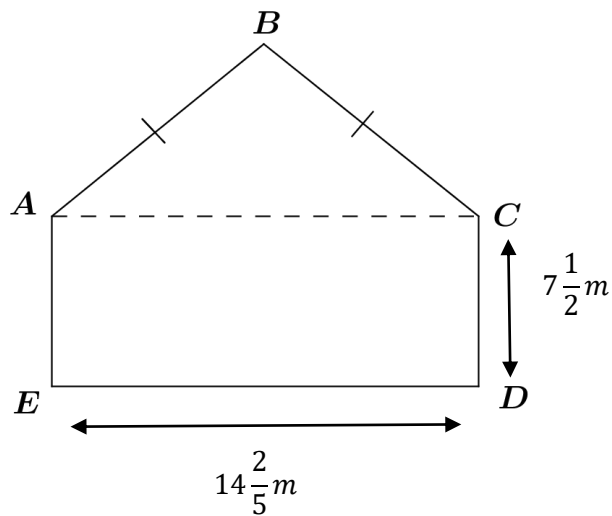
What was the temperature at lunch time?

Answer: ………………

(2 marks)

18. At a basketball match there were 500 fans. 40% of the fans were not students. 40% of the students were from the English School. Out of the students from the English School, $\frac{4}{5}$ were boys.

How many female students were at the match from the English School?

Answer: ………………

(4 marks)

19. (The diagram is not drawn to scale)

Mr Panayiotis' garden is made up of an isosceles triangle ABC, where AB = BC, and a rectangle ACDE, as in the diagram above.

a) Find the area of the rectangle ACDE.

Answer: ………………m^2

(3 marks)

The perimeter of the **whole** garden is 45m.

b) Find the length of the side AB.

Answer: ………………. m
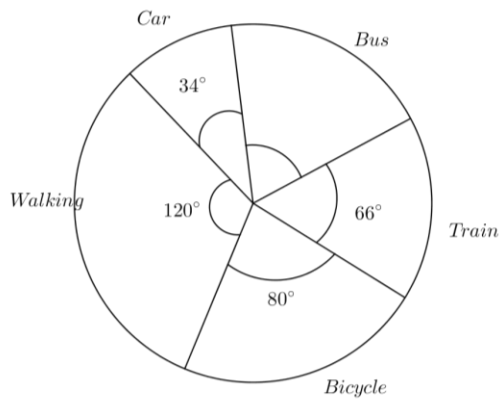
(4 marks)

Mr Panayiotis constructed a fence around the garden using pieces of readymade wood of length $1\frac{2}{7}m$ each. Each piece costs € 10.50.

c) How much did Mr Panayiotis have to pay for the fence?

Answer: € ………………

(3 marks)

20. As part of a survey in a town, 540 people were asked how they travel to work. The pie chart shows the results of this survey.

(The pie chart is not accurately drawn)

a) How many people use the car to get to work?

Answer: ………………..

b) How many people use the bus to get to work?

Answer: ………………..

(4 marks)

21. Mr Alexis bought a piano that cost € 1800. The shop owner gave him a 10 % discount. Mr. Alexis gave $\frac{1}{3}$ of the reduced cost as a down payment. He will pay off the remaining amount after 6 months, with a 7% interest. How much interest will he pay?
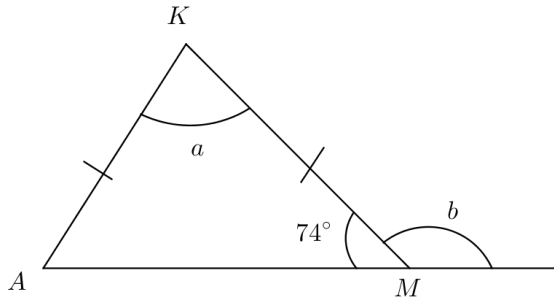
Answer:€ ………………..

(5 marks)

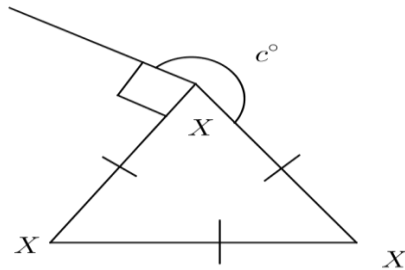**22.** (The diagrams are not drawn to scale)

Find the missing angles.

The triangle KAM is isosceles.   MA = KM

a = ……………………….   b =………………………….

Triangle XYZ is equilateral.

c =……………………….

(4 marks)

23. Complete the boxes with the missing numbers.

$1^2 +$ ⬜ $\times$ 1 $=$ 1 $\times$ 3

$2^2 +$ 2 $\times$ ⬜ $=$ 2 $\times$ 4

$3^2 +$ 2 $\times$ 3 $=$ ⬜ $\times$ ⬜

$4^2 +$ 2 $\times$ ⬜ $=$ 4 $\times$ ⬜

....

$10^2 +$ 2 $\times$ 10 $=$ ⬜ $\times$ ⬜

(4 marks)

Write down the result of the following:

$$9998^2 + 2 \times 9998$$

Answer: ………………

(2marks)

24.

Birthday Hall "Happy House"**€ 25**,

Plus € 10 for every $\frac{1}{2}$ hour after 12.00 at noon.

Birthday Hall " Play Kids"**€10**

Plus €12 for each $\frac{1}{2}$ hour after 12.00 at noon.

a) Maria and Anna want organise a birthday party. The party will start at 12.00 at noon.

i) Maria wants to go to "Happy House" Hall and finish the party at 3.00 pm. How much will the cost be for the Hall?

Answer: ………………

(2marks)

ii) Anna wants to go to "Play Kids" Hall but is only willing to pay up to € 70. What time should the party end?

Answer: ………………

(3marks)

b) Another birthday hall "Rokoko",charges a fixed rent price plus an extra amount for every $\frac{1}{2}$ hour after 12.00 at noon. If the party finishes at 2.00 pm then the cost will be € 47, if the party finishes at 3.00pm then the cost will be € 63.

i) How much does each extra $\frac{1}{2}$ hour cost after 12.00 at noon?

Answer: ………………

(2marks)

ii) What is the fixed rent charge?

Answer: ………………

(2marks)

25. The starting value of a share is € 40. In the next 5 years the price changed as follows:

Increased by 50 %, decreased by 50 %, increased by 50 %, decreased by 50 % and increased by 50 %.

What is the final value of the share?

Answer: ………………

(3 marks)

26. Work out the following:

a) $10^2 - 90 =$ …………………………….

b) $10^4 - 90 =$ …………………………….

c) $10^5 - 90 =$ …………………………….

(2 marks)

Using a clever method, find the **sum** of the digits of the result you get from the following calculation.

$$10^{52} - 90$$

Answer: ………………

(2 marks)

END OF PAPER