THE GRAMMAR SCHOOL

ENTRANCE EXAMINATIONS

12 MARCH 2018

SUBJECT :	MATHEMATICS
TIME :	1 HOUR AND 30 MINUTES

Instructions to students.

1. Write your number on the first page.

2. You are not allowed to use any kind of a calculator.

3. Using a pen is preferable, but if you wish you can use a pencil.

4. Correction fluid (tippex) or tape is not allowed

5. You are not allowed to talk to one another.

6. Read the instructions of each question carefully.

7. If you don't know a question, go to the next one.

8. Show all the workings.

9. The examination consists of 20 questions and you must answer **ALL** of them.

10. The total number of marks is 100.

1. Evaluate the following:

(a) $30 + 2 \times (40 - 60 \div 15) =$

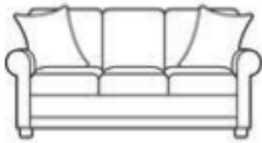Answer: _____ (4)

(b) $4 \times 0.32 - \frac{1}{2} =$

Answer: _____ (2)

(c) $5 - 4\frac{1}{3} \div \frac{26}{9} =$
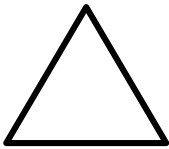
Answer: _____ (3)

(Total 9 Marks)

2. Marios spent $\frac{3}{5}$ of his money in order to buy a sofa that cost €1320.
   How much money did he have left?
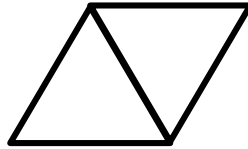
Answer: _____

(Total 2 Marks)
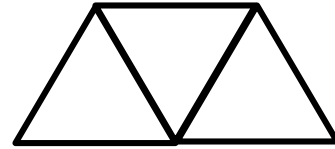
3. Christina used sticks in order to prepare the following shapes in the pattern.

Shape 1   Shape 2   Shape 3

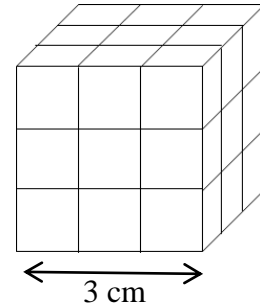(a) Draw the next shape in the pattern.   (1)

(b) Which shape of the pattern will have a total of 15 sticks?

Answer: _____ (2)

(Total 3 Marks)

4. Using small and identical cubes with edge of length 1 cm we constructed a big cube. The big cube has edge of length 3cm and it is solid without any gaps.

(a) Find the number of small cubes we have used.

3 cm

Answer: _____ (2)

(b) We painted the external surfaces of the big cube with a red colour. How many of the small cubes have only one surface painted red?

Answer: _____ (2)

(Total 4 Marks)

5. A bag contains 2 cent coins and weighs 3.6 kg. Each coin weighs 3 g. What is the total amount of money, in euro, in the bag?

Answer: _____ (4)

(Total 4 Marks)

6. (a) In a survey, 74% of the people who were asked to participate, agreed to answer. If 370 people agreed to answer, find the number of people who were asked to participate in the survey.
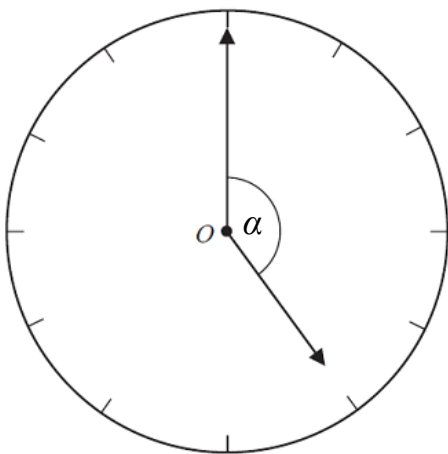
Answer: _____ (3)

(b) Harry bought a toy for €80. How much does he have to sell it for, in order to make a profit of 20%?
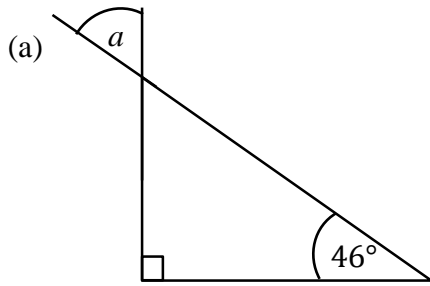

Answer: _____ (3)

(Total 6 Marks)

7. Find the size of the angle marked α when the clock shows 5:00.

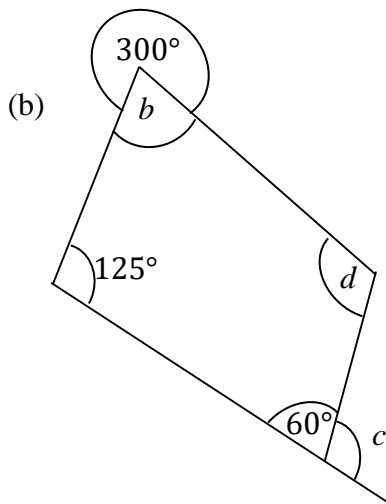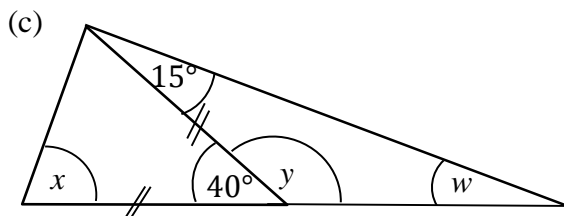Answer: _____ (2)

(Total 2 Marks)

8. Find the angles marked with letters.

(a)

Answer: $a =$ _____ (1)

(b)

Answer: $b =$ _____ , $c =$ _____ , $d =$ _____ (3)

(c)

Answer: $x =$ _____ , $y =$ _____ , $w =$ _____ (3)

(Total 7 Marks)

9. Three buses make a start at 6 a.m. from the same starting point for three different routes without any stops and then they return back to the starting point. The first bus needs 40 minutes for each route, the second bus needs 30 minutes and the third bus needs 45 minutes.

After how many hours will all three buses first meet at the starting point again?
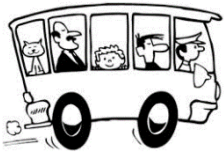
Answer: _____ (4)

(Total 4 Marks)

10. (a) A ship that travels with a speed of 60 miles per hour, reaches its destination in 12 days. If it travels with a speed of 40 miles per hour and covers the same route, how many days will it need to reach its destination?
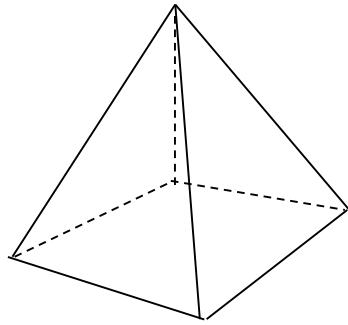
Answer: _____ (2)

(b) We can buy 14 identical notebooks of the same price, with €35. How many such notebooks can we buy with €50?

Answer: _____ (2)

(Total 4 Marks)

11. George used wire to make a pyramid, shape 1, and covered all of its five surfaces with thin paper. The base of the pyramid is a square and the other four surfaces are equal isosceles triangles with dimensions as shown in the net of the pyramid.

Shape 1

7.6 cm

6 cm   7 cm

6 cm   7.6 cm

7.6 cm
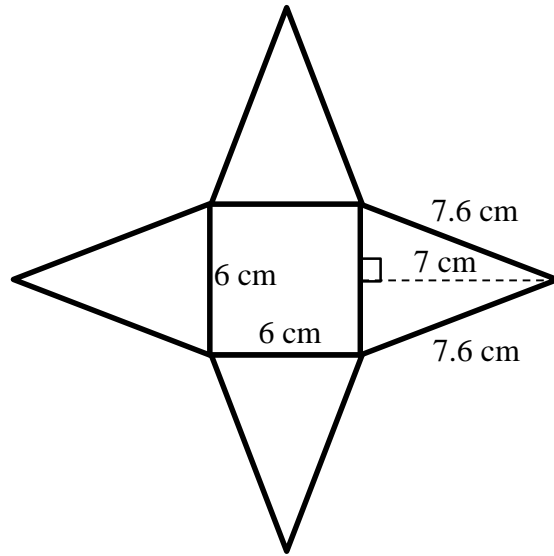
Net of the pyramid

Find,

(a) the length of the wire that was used,

Answer: _____ (3)

(b) the area of the paper that was used.

Answer: _____ (4)

(Total 7 Marks)

12. A box contains 7 tiles with numbers.

| 1 | 2 | 3 | 5 | 6 | 8 | 9 |

Elina will select a tile at random from the box, look at the number and put the tile back in the box.

(a) Find the probability that the number written on the tile will be

(i) bigger than 3,

Answer: _____ (1)

(ii) even,

Answer: _____ (1)

(iii) prime.

Answer: _____ (1)

(b) If a new tile with the number 5 is added in the box, what is the probability now that a randomly selected tile will have the number 5 written on it?
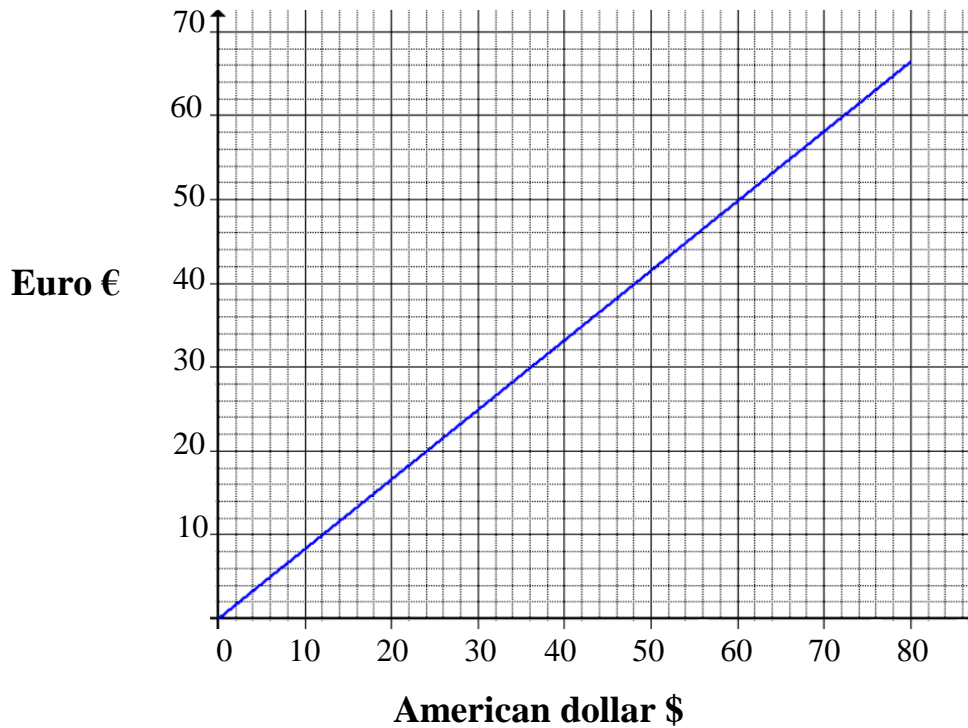
Answer: _____ (2)

(Total 5 Marks)

13. The sum of four consecutive numbers is 230. Find the sum of the two smallest of those numbers.

Answer: _____ (4)

(Total 4 Marks)

14. The graph shows the exchange rate of euro, €, and the American dollar, $.

Euro €

American dollar $

(a) Find the price of a toy in euros if it costs $70.

Answer: _____ (2)

(b) How many dollars correspond to €30?

Answer: _____ (2)

(Total 4 Marks)

15. Charitini found that the average of 5 numbers is 38. Then she realised that she had made a mistake on one of the numbers and instead of using number 30, she used number 40 in her calculations. Which is the correct average of the 5 numbers?

Answer: _____ (4)

(Total 4 Marks)

16. In a football league, the points are awarded as follows:

win – 3 points
draw – 1 point
loss – 0 points

In last year's league, the A team played a total of 30 matches and won 10 of them. The ratio of the matches that the team won to the matches that it lost was 5 : 6.

(a) How many matches did the A team draw?

Answer: _____ (3)

(b) How many points was the A team awarded in last year's league?

Answer: _____ (2)

(Total 5 Marks)

17. A florist bought 10 dozen roses at the price of 60 cents each and gave away 20% of them. Of the remaining roses, $\frac{2}{3}$ were red and the rest were white. She then prepared bunches that contained four roses each of the same colour. She sold each bunch of red roses for €5 and each bunch of white roses for €3.50.

How much profit did she make from this sale?

Answer:_____ (9)

(Total 9 Marks)

18. An event centre rents rooms for birthday parties and charges a fixed fee of €80 for each room and additionally €60 for each hour of rent. On Saturday, two rooms were rented and the total income was €700. We know that one of the rooms was rented for 4 hours. How many hours was the second room rented for?
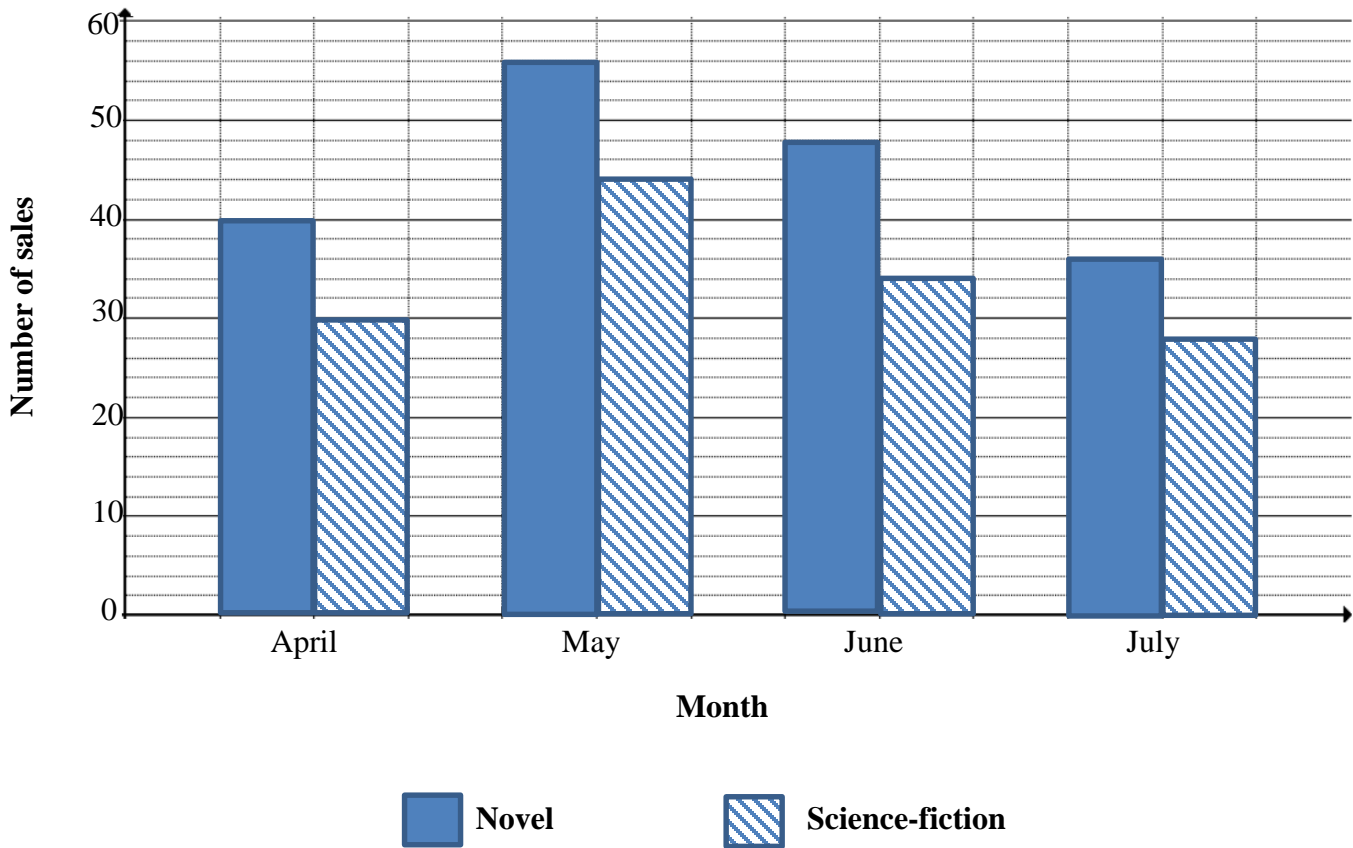
Answer: _____ (5)

(Total 5 Marks)

19. Three siblings, Minas, Paris and Lena have a total of €210. Paris has three times as much money as Minas has while Minas and Lena have a total of €90. How much money does each one have?

Answer: Minas _____ , Paris _____ , Lena _____ (3)

(Total 3 Marks)

20. The bar chart given below presents the sales of books in the bookshop " The Magic Book"
that were made over the period April – July.

(a) Which month had the smallest number of sales of books in total?

Answer: _____ (1)

(b) Which month had the greatest difference in the number of sales of novels and
Science-fiction and how much is the difference?

Answer: _____ , _____ (2)

(c) Calculate the average number of sales of novels for each month for the given time period.

Answer: _____ (3)

(d) Calculate the number of Science-fiction books sold in June as a percentage of the total number of Science-fiction books sold.

Answer: _____ (3)

(Total 9 Marks)

END