THE G C SCHOOL OF CAREERS

ENTRANCE EXAMINATION

SCHOOL YEAR 2012-2013

MATHEMATICS

(This examination paper consists of 21 pages including this page)

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ENTRANCE EXAMINATION

SCHOOL YEAR 2012-2013

MATHEMATICS   Time: 1 hour and 30 minutes

- This paper consists of **25 questions**.

- Answer **ALL** the questions in the spaces provided.

- You must **show all your working**.

- Your answers must be clearly and neatly presented.

- The use of calculator is not permitted.

1. Find the missing numbers:

200, 195, 185, 170, _____, 125, _____

(2 marks)

_____

2. Nick decided to keep a diary over the summer. He made his first diary entry on 23 July. He kept daily records, until the day he went back to school which was on 2 September. Work out how many entries Nick's diary had.

(3 marks)

Answer: _____

_____

3. A maths book consists of two sections: Arithmetic and Geometry. If the

size of the Geometry section is equal to $\dfrac{1}{3}$ of the size of the Arithmetic

section, what fraction of the book does the Arithmetic section represent?

(2 marks)

Answer: _____

_____

4. Tom owns some canaries and some cages. He says: "If I place one canary in each cage, one bird is left without a cage. If I place two canaries in each cage, one cage is left without a bird". Find the number of canaries and the number of cages Tom owns.

(2 marks)

Answer: Canaries _____

Cages _____

_____

5. In a school library there are several books. Helen has read 85% of the books and Nat has read 90% of the books. If Nat has read 2 books more than Helen has, find the total number of the books in the library.

(3 marks)

Answer: _____

_____

6. A rectangular dining table seats six people (see diagramme below). During a school event, the students placed 10 such rectangular tables, one behind the other, to form one really long dining table. How many people can sit at the table the students have formed?

(3 marks)
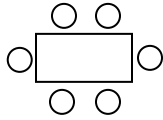
Answer: _____

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7. If you divide my age by 2, 3, 4 and 6, the remainder is 1. However, if you divide my age by 7, there is no remainder. Calculate my age.

(2 marks)

Answer: _____

8. Mary is about to fly from London to New York to visit her friend Michael. The journey will take 7 hours. The time difference between London and New York is 5 hours (London is ahead of New York). If Mary's plane takes off from London at 11:00 a.m., what will the time be in New York when the plane lands? **(specify a.m. or p.m.)**

(3 marks)

Answer: _____

9. Last Monday, a snail set off to visit its grandmother which is 90 metres away. Apart from the days it stops for rest, the snail covers one metre each day, without any stops and at a constant speed. The snail stops travelling every 10th day (i.e. after having travelled for 9 days) and it has a rest for 24 hours. What day will the snail reach its grandmother?

(4 marks)

Answer: _____

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10. If $\triangle+\triangle=\square$ and $\square+\triangle=\bigcirc$ and $\lozenge=\bigcirc+\square+\triangle$, find how many $\triangle$ are equal to $\lozenge$.

(2 marks)

Answer: _____

11. All the students of a primary school watched a play last week. 60% of the students of the school are boys. 68% of the girls said that they liked the play, while the other 64 girls said that they were bored. Find how many boys attend the school.

(4 marks)

Answer: _____

12. Work out the following, giving your answer in its simplest form.

a) $\dfrac{6 - 2\frac{2}{5}}{4 - \frac{2}{3} \times \frac{4}{5}} =$

(4 marks)

Answer: _____

b) $\dfrac{5}{6} \div \left(3\frac{2}{7} - \frac{3}{2} \right) \times 6 =$

(3 marks)

Answer: _____

_____

13. When John was given a digital watch as a present, he started working out the sum of its digits. For example, when the time is 20:35, the sum is 10 (2+0+3+5=10). What is the largest sum John can come up with?
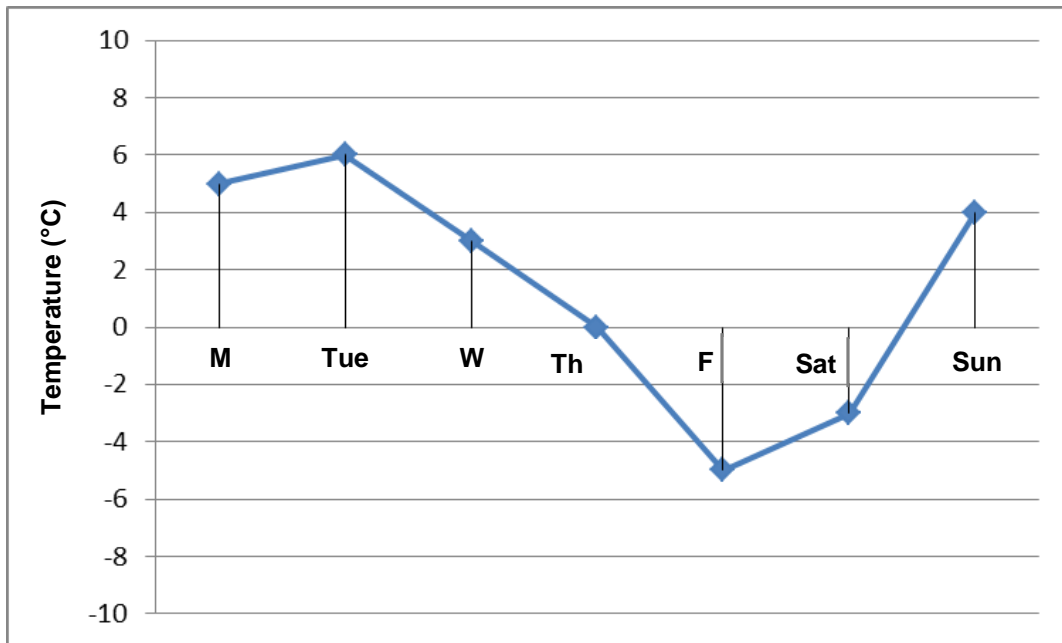
(3 marks)

Answer: _____

_____

14. 12 boys and 15 girls took the same maths exam. The boys' average mark was 74 and the girls' average mark was 76.4. Calculate the average mark of all the students, giving your answer to the nearest whole number.

(4 marks)

Answer: _____

_____

15. The line chart below shows the temperature over a period of one week.

Write down:

a) the day with the highest temperature.

(1 mark)

Answer: a) _____

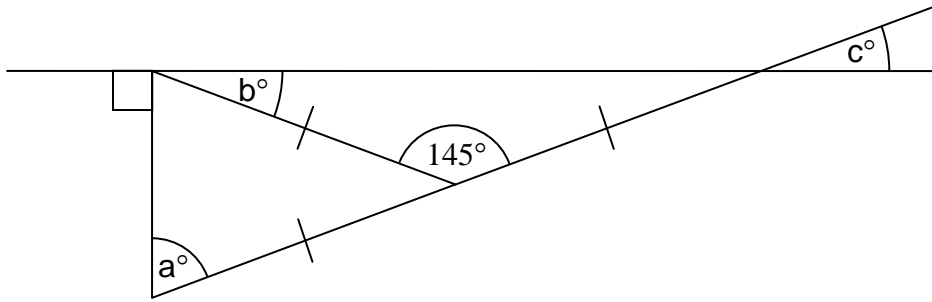b) the lowest temperature.

(1 mark)

Answer: b) _____

c) the day on which the temperature was $0°$.

(1 mark)

Answer: c) _____

16. Calculate the unknown angles.

(5 marks)

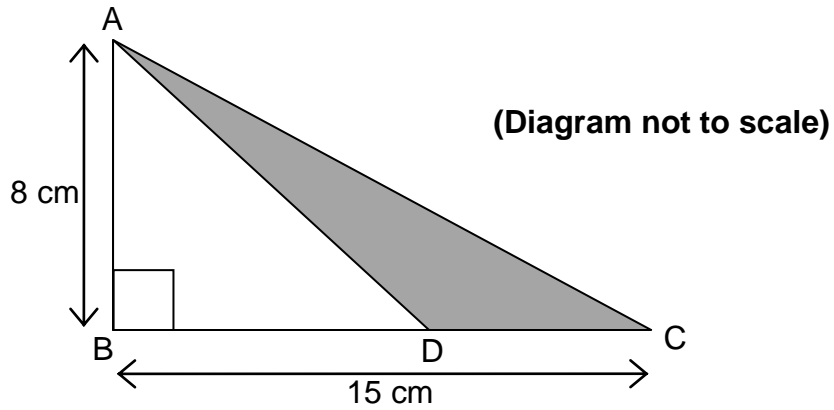Answer: Angle a = _____

Angle b = _____

Angle c = _____

17. Andy opened his money box and inside he found in total, 42 coins and paper banknotes. In the money box there were only €2 coins and €5 banknotes. Andy wants to buy an electronic game which costs €200. His father has given him €65 which Andy will use along with the amount in his money box, to buy the game. Calculate the number of coins and the number of banknotes that were in Andy's money box.

(4 marks)

Answer: Coins _____

Banknotes _____

_____

18.

(Diagram not to scale)

In the diagram above, AB = 8cm, BC = 15cm and angle B is a right angle.

If the area of triangle ABD is 48cm^2, find:

a) the length of DC.

(3 marks)

Answer: a) DC = _____

b) the area of the shaded triangle ADC.

(3 marks)

Answer: b) _____

_____

19. A bus travelled from town A to town B at a speed of 80 kilometres per hour. Every 2,5 hours it stopped for exactly 20 minutes so that the passengers could rest. The distance between towns A and B is 584 kilometres and the journey started at 8:30 in the morning. What time did the bus reach its destination?

(5 marks)

Answer: _____

20. To complete $\frac{3}{16}$ of an assignment, a person needs $\frac{2}{5}$ of an hour.

Find in minutes, how long the person would need to complete $\frac{7}{8}$ of the same assignment.
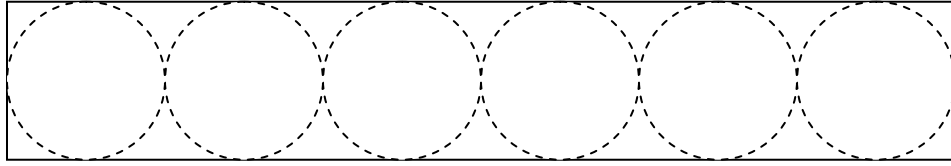
(4 marks)

Answer: _____

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21. Four children, John, Danae, Andrew and Corina sit next to each other. John sits between Danae and Andrew, his distance from each child being the same. The same distance exists between Danae and John as well as between Andrew and Corina. John is four metres away from Corina. Find the distance between Danae and Corina.

(3 marks)

Answer: _____

22. Using the rectangle below (and without using a ruler),

(Diagram not to scale)

a) find the ratio of the width to the length.

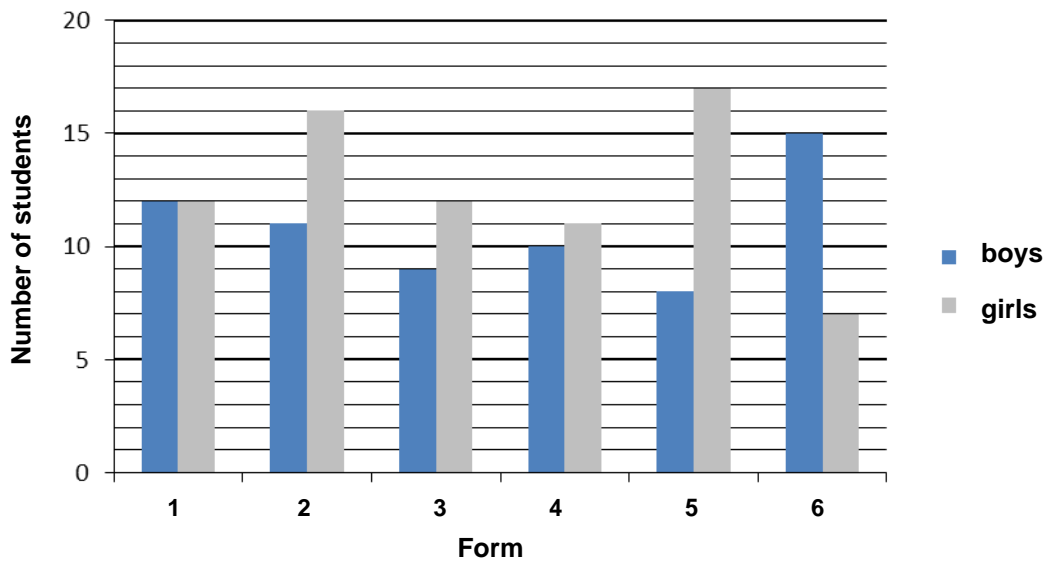**(2 marks)**

Answer: _____

Given that all circles are identical and each circle has a 110m circumference, find:

b) the area of the rectangle. Use $\pi = \dfrac{22}{7}$.

(4 marks)

Answer: _____

_____

23. The chart below shows the number of boys and the number of girls in each of the forms of a primary school.

Find:

a) How many more girls there are than boys in Form 5.

(1 mark)

Answer: a) _____

b) Which Form has the largest number of students.

(2 marks)

Answer: b) _____

c) The percentage of the students of Form 3 in relation to the students of the entire school.

(3 marks)

Answer: c) _____

24. Last month, 90 students went on a trip.

The table below includes information regarding the students' food orders.

	Chicken	Burger	Fish	TOTAL
BOYS			15	54
GIRLS	12			
TOTAL		28	30	90

a) Complete the missing information in the table.

(3 marks)

If a student is **randomly selected**, find:

b) the probability of a student having opted for a burger.

(1 mark)

Answer: b)_____

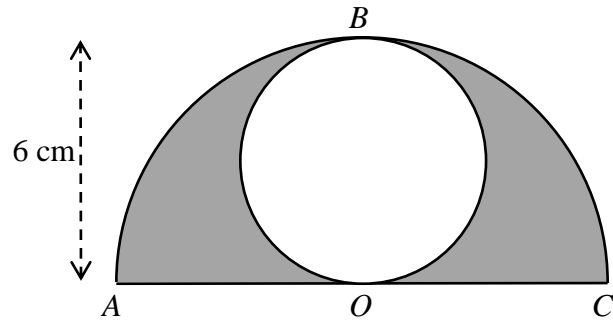c) the probability of a girl having opted for fish.

(1 mark)

Answer: c)_____

d) the fraction that represents the number of students who did not opt for chicken (in relation to the number of all students).

(1 mark)

Answer: d)_____

_____

25. ABC is a semicircle, the centre of which is *O*. There is a circle inside the semicircle (see diagram below).

Use $\pi = 3{,}14$ to find:

a) the area of the shaded region.

(5 marks)

Answer: a) _____

b) the perimeter of the shaded region.

(3 marks)

Answer: b) _____

THE END