THE G C SCHOOL OF CAREERS

SAMPLE EXAMINATION PAPER

MATHEMATICS

FORM: 1 TO 2

Time allowed: 2 hours

2010-2011

NAME: _____

INSTRUCTIONS TO CANDIDATES

- This paper has **25** questions.
- Answer **ALL** questions in the space provided.
- Make sure that your answers are clearly labeled.
- Answers without any workings may gain no credit.
- **NO** calculator is allowed

1. Convert the recurring decimal $0.\dot{2}\dot{3}$ to a fraction.

(2 marks)

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2. Two cities are 15 km apart. On the map this distance between them is represented by 25 cm. Find the map ratio of the map.

(2 marks)

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3. Work out $\frac{3}{5} + 0.12 + 6\%$ of 10. Give your answer to the nearest whole number.

(3 marks)

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4. Work out the value of $(-\frac{1}{4})^2 \div (-\frac{1}{4})^3$.

(3 marks)

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5. (a) Express 200 as the product of its prime factors.

(1 mark)

(b) Work out the Lowest Common Multiple (LCM) of 75 and 200.

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(2 marks)

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6. If $k = -3,\ m = \frac{1}{4}\ and\ n = -4$, find the value of A.

$$A = \frac{k^2 + 8m}{2n - 3k}$$

(3 marks)

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7. Plumbers' solder is made from tin and lead. The ratio of the weight of tin to the weight of lead is 1:2.

(a) Work out the weight of tin and the weight of lead in 120 grams of plumbers' solder.

(2 marks)

(b) What weight of plumbers' solder contains 25 grams of tin?

(1 mark)

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8. A number is chosen at random from the first 10 positive integers. What is the probability that it is:

(a) an even number,

(b) a prime number,

(c) exactly divisible by 3?

(3 marks)

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9. Julia is five times as old as Marcos. In three years, Julia's age will be two years less than four times Marco's age. Find their present ages.

(4 marks)

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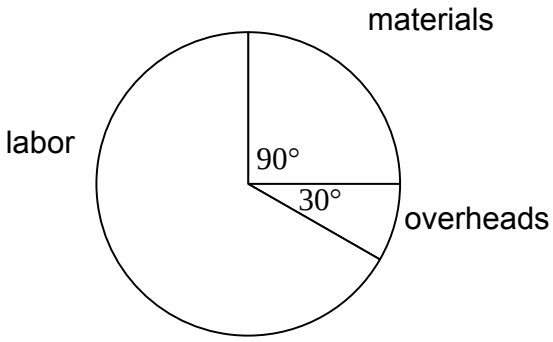
10. There are 40 shops in the High Street, 50% of which sell food, 30% of which sell clothes and the remainder sell shoes. How many High Street shops sell shoes?

(3 marks)

11.



This pie chart shows the costs involved in making a television set. The total cost is €180.

(a) What is the cost of materials?

(b) What fraction of the total cost is the cost of materials?

(c) What is the labour cost?

(3 marks)

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12. Simplify $\frac{a}{2b} + \frac{b}{2a} - \frac{a^2 + b^2}{6ab} =$

(3 marks)

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13. Solve the following equations.

(a) $\sqrt{2x-3}=5$

(2 marks)

(b) $2y+1=\frac{y-3}{4}-\frac{2y-2}{5}$

(3 marks)

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14. Two girls have €76 together. If the first girl gave to the second girl €7, they would have the same amount of money. How much money did each girl have?

(3 marks)

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15. Given the vectors $\boldsymbol{a} = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$ and $\boldsymbol{b} = \begin{pmatrix} -2 \\ 6 \end{pmatrix}$.

(a) Find the magnitude of ***a+b*** .

(3 marks)

(b) Find the vector ***2a-3b***.

(3 marks)

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16. Find the value of:

(a) $-4+5(3-6)-(-2)=$

(2 marks)

(b) $-(-2)^3-4^2=$

(2 marks)

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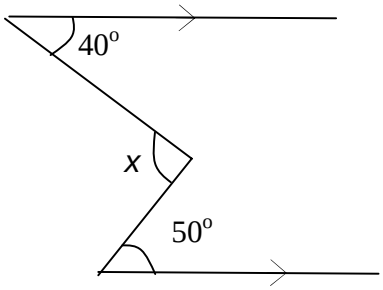
17. Work out the size of the angle x. Show all your steps and give a reason for your answers.



(4 marks)

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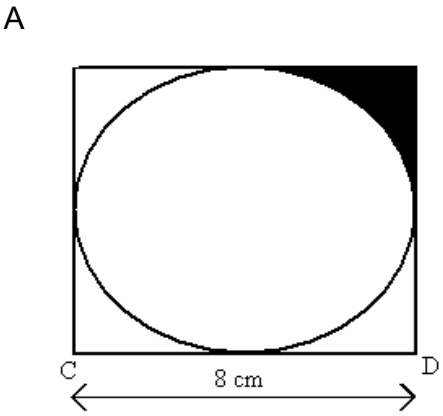
18. ABCD is a square. Find the shaded area, in cm^2, giving your answer in 2 decimal places. (Use π = 3.14)



(4 marks)

19.

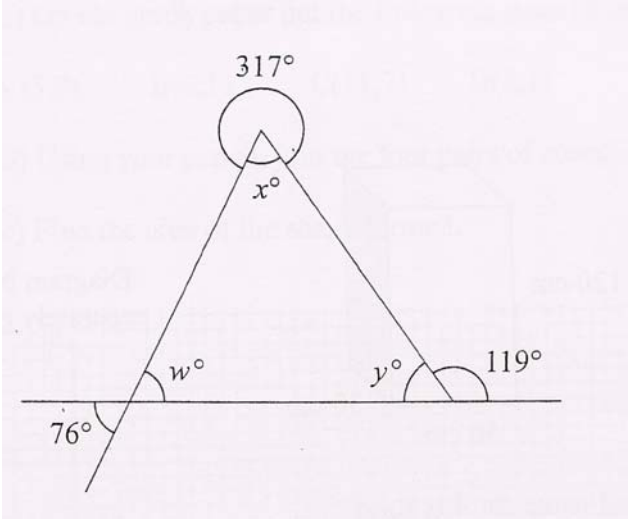


Diagram NOT accurately drawn

(a) (i) Find the value of w.

(ii) Give reasons for your answer.

(2 marks)

(b) (i) What type of angle is 317° angle?

(ii) Find the value of x.

(2 marks)

(c) (i) Find the value of y.

(ii) Give reasons for your answer.

(2 marks)

20. The lengths of the diagonals of a rhombus are 12 cm and 16 cm.

(a) Calculate the area, in cm^2, of the rhombus.

(b) Calculate the perimeter, in cm, of the rhombus.

(4 marks)

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21. Here are seven numbers

2, 6, 3, 3, 10, 4, 7

(a) Find the mode.

(1 mark)

(b) Find the mean.

(3 marks)

(c) Find the median.

(2 marks)

(d) Find the range of these numbers.

(1 mark)

22.

(a) Sunil invests € 2000 at a rate of 6% per year with **simple** interest. How long will it take for the interest to reach € 480?

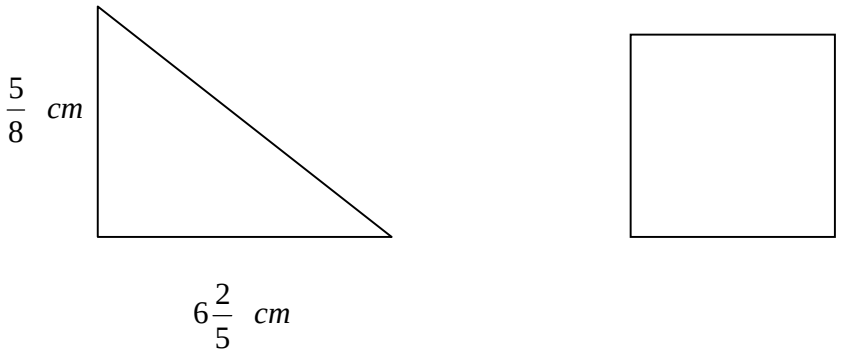
(2 marks)

(b) Pryanka invests € *P* for 4 years at a rate of 6% per year with **compound** interest. Calculate how much Pryanka must invest in order to obtain the same amount of interest as Sunil. Give your answer correct to 3 significant figures.

(3 marks)

23.

Diagrams NOT accurately drawn



The **area** of the square is 18 times the area of the triangle.

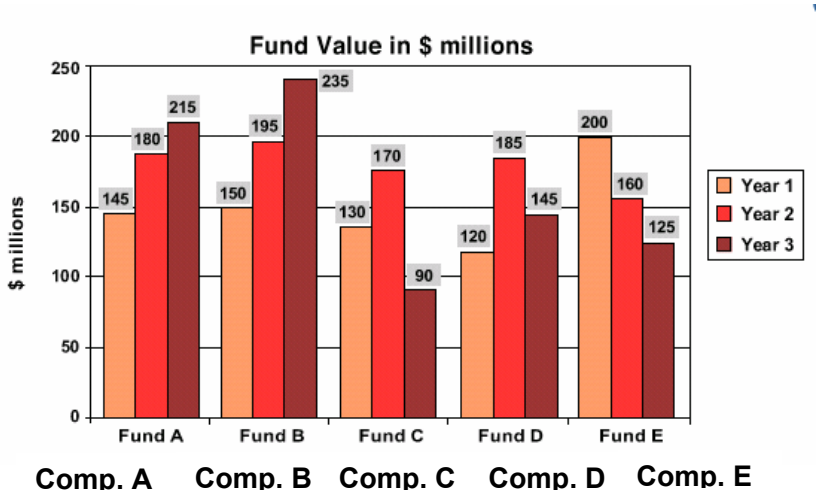
Work out the **perimeter** of the square.

(5 marks)

24. The graph below shows the value of five different companies in years 1, 2 and 3, in $ millions.

(a)

COMPANY VALUE IN $ MILLIONS



Comp. A **Comp. B** **Comp. C** **Comp. D** **Comp. E**

(a) Which company had the highest value in Year 3?

(1 mark)

(b) Which company had the lowest value in Year 1?

(1 mark)

(c) Between which two years did company E had the biggest decrease in its value?

(2 marks)

25. A child's toy consists of a cone inside a sphere. The radius of the sphere, OA = 10 cm and the radius of the base of the cone, AC = 6 cm.

(a) **Show** that VOC, the height of the cone, **is 18 cm**.

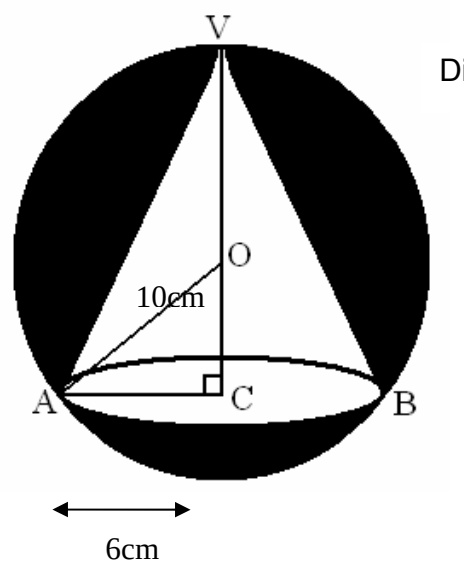


Diagram NOT to scale

(2 marks)

(b) Calculate the volume of the sphere. Give your answer as a fraction in terms of π.

(2 marks)

(a) Calculate the volume of the cone. Give your answer in terms of π.

(2 marks)

(b) Find the shaded volume. Give your answer in terms π, in its simplest form.

(2 marks)

TOTAL MARKS FOR PAPER: 100

END