

# KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

**HALF YEARLY EXAMINATION – 2014/2015**

**Track 3**

**FORM 3**

**MATHEMATICS** Track 3

**TIME: 30 mins**

**Non Calculator Paper**

Question	1	2	3	4	5	6	7	8	9	10	11	Total
Max. Mark	2	4	2	2	2	2	2	3	2	3	1	25
Mark												

**DO NOT WRITE ABOVE THIS LINE**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## **Instructions to Candidates**

- **Answer all questions.**
- **This paper carries a total of 25 marks.**
- **Calculators and protractors are not allowed.**
- **All necessary working must be shown.**

1. Evaluate  $4^{-2} \times 4^2$

Ans \_\_\_\_\_

(2 marks)

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2. (i) **Simplify**  $(-4x) \times (-10xy)$

Ans: \_\_\_\_\_

- (ii) **Factorise**  $4\pi^3 + 6\pi^2$

Ans: \_\_\_\_\_

(4 marks)

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3. Write :

(i) 272.8 in **standard form**: \_\_\_\_\_

(ii) 0.568 as a **percentage**: \_\_\_\_\_

(2 marks)

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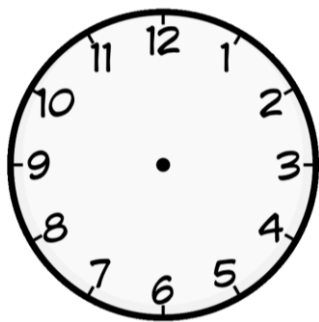
4. Make  $y$  the subject of the formula:  $8y - 2 = 5x - 8$

Ans:  $y =$  \_\_\_\_\_

(2 marks)

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5.



In 1 hour, the tip of the minute hand of a clock makes a circle with a circumference of 60 cm. Calculate the **length of arc** that the minute hand makes from 4.00 a.m. to 4.20 a.m.

Ans: \_\_\_\_\_ cm

**(2 marks)**

6.

If  $p = -7$  and  $q = -3$ , what is the value of  $5 + 2p + 3q$ ?

Ans: \_\_\_\_\_

**(2 marks)**

7.

Find the **total sum of the interior angles** in **two** triangles and **two** parallelograms.

Ans: \_\_\_\_\_

**(2 marks)**

8.

(i) Simplify the ratio 8 : 40 : 56

Ans: \_\_\_\_\_

(ii) Divide €3200 in the ratios 5 : 11.

Ans: € \_\_\_\_\_ , € \_\_\_\_\_

**(3 marks)**

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9. A family of **four** members has enough groceries for 30 days.

If one guest comes and stays with them, how many days will the groceries last?

Ans: \_\_\_\_\_ days

**(2 marks)**

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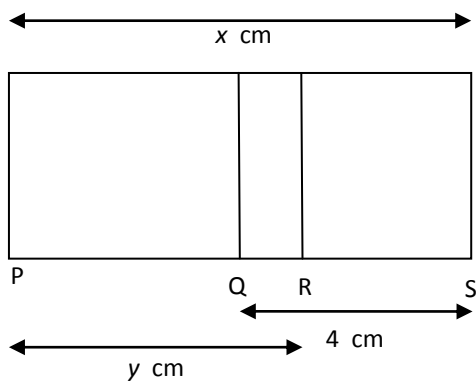
10. Work out  $5\frac{1}{3} \times 2\frac{1}{2} \div 2\frac{2}{7}$ , giving your answer as a mixed number.

Ans: \_\_\_\_\_

**(3 marks)**

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11. The length **RS** in terms of  $x$  and  $y$  is:



(A)  $(x + y)$  cm

(B)  $(y + 4)$  cm

(C)  $(x - y)$  cm

(D)  $(4 - x)$  cm

Ans: \_\_\_\_\_

**(1 mark)**

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# KULLEĠĠ SAN BENEDITTU

## Secondary School, Kirkop



HALF YEARLY EXAMINATION – 2014/2015

**Track 3**

FORM 3

**MATHEMATICS** Track 3

TIME: 1hr 30mins

### Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	Non	Global Mark
Max. Mark	4	7	6	6	6	4	7	4	6	11	4	4	6	75	25	100
Mark																

**DO NOT WRITE ABOVE THIS LINE**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN.

ANSWER ALL QUESTIONS

1. (a) Round each number to 1 significant figure and hence estimate the value of:

$$\sqrt{1.28 + 19.99 \times 4.37}$$

Ans: \_\_\_\_\_

- (b) Use your calculator to find the value of  $\sqrt{1.28 + 19.99 \times 4.37}$  giving your answer correct to:

(i) 3 significant figures

(ii) 3 decimal places

Ans: \_\_\_\_\_

Ans: \_\_\_\_\_

**(4 marks)**

2. (a) Expand and simplify where possible:

(i)  $2(3 + 4a - 7b)$

(ii)  $x(x + 3y) - 2(3xy - 4)$

Ans: \_\_\_\_\_

Ans: \_\_\_\_\_

(b) Expand:  $(x - 7)(x + 3)$

Ans: \_\_\_\_\_

**(7 marks)**

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3. After 18 months, the simple interest earned on €12 000 was €540.

(a) Work out the rate per annum.

Ans: \_\_\_\_\_%

(b) For how long would the same principal with the same rate earn €1260 simple interest?  
Give your answer in years and months.

Ans: \_\_\_\_\_ years \_\_\_\_\_ months

**(6 marks)**

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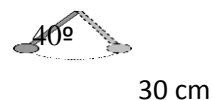
4. (a) A wiper on a car windscreen covers a **third** of a whole revolution in one sweep.

Find the area covered by the wiper in one sweep, if the wiper is 45 cm long. Give your answer correct to the nearest whole number.

$$16p^5q^3 + 24p^2q$$

Ans: \_\_\_\_\_ cm<sup>2</sup>

- (b) A pendulum is 30 centimetres long. In one swing, it makes an angle of 40° and makes an arc of a circle of length  $x$  cm. Work out the value of  $x$ . Give your answer correct to the nearest whole number.



$$\frac{15a^2}{4b^3} \cdot \frac{2ab^6}{27a^4}$$

Ans: \_\_\_\_\_ cm

(6 marks)

5. (a) Factorise completely:



Ans: \_\_\_\_\_

- (b) Simplify:

(i)  $(2x^2)^3 \div (2x^3)^2$

(ii)

Ans: \_\_\_\_\_

Ans: \_\_\_\_\_

(6 marks)

6. Two remote-controlled cars set off from the same position. After a short time, one has travelled **20 m due north** and the other **17 m due east**.

How far apart are the two cars? *Give your answer correct to 1d.p.*


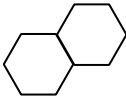
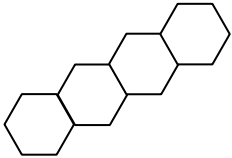


Ans: \_\_\_\_\_ m

**(4 marks)**

7. A path is made using regular hexagonal tiles. Each side is 1 metre long.

(a) Draw a sketch of the missing stage.

			
<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>	<b>Stage 4</b>

(b) Complete the following table showing the perimeter of the first five stages.

Stage	1	2	3	4	5
Perimeter (in m)	6				

(c) Write a formula for the  $n^{\text{th}}$  term.

Ans: \_\_\_\_\_

(d) Find the number of tiles needed to have a perimeter of 50 metres.

Ans: \_\_\_\_\_ tiles

**(7 marks)**

8. Pastry is made with **twice and a half flour** as there is **fat** by weight.

(a) What is the ratio of the weight of the **flour** to the weight of the **fat**? Give your answer in its simplest form?

(b) The fat and flour together weigh 560 g. How much flour is there in this mixture?

Ans: \_\_\_\_\_ g  
(4 marks)

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9. (a) Sandra needs to repair her TV set on site. The technician charges a €30 call-out fee plus €15 for each **half** hour. If **x** stands for the number of hours, write an algebraic expression for the repair cost, **C**, in terms of **x**.

Ans: **C** = \_\_\_\_\_

(b) Work out how much Sandra pays if the technician takes **an hour** to repair her TV set.

Ans: € \_\_\_\_\_

(c) Work out how much Sandra pays if the technician takes **an hour and a half** to repair her TV set.

Ans: € \_\_\_\_\_

(6 marks)

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10. (a) Each **interior** angle of a **regular** polygon is  $135^\circ$ . Work out:

(i) the size of one **exterior** angle.

Ans: \_\_\_\_\_

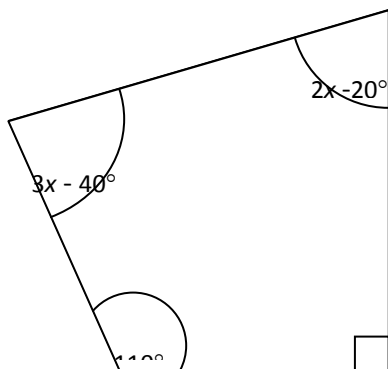
(ii) the **number of sides** of the polygon.

Ans: \_\_\_\_\_ sides

(b) Work out the sum of the interior angles of an 11-sided polygon.

Ans: \_\_\_\_\_

(c) The four interior angles of a **quadrilateral** are:  $110^\circ$ ,  $(2x - 20)^\circ$ ,  $(3x - 40)^\circ$  and  $90^\circ$ . Find the value of  $x$ .



*Diagram not to scale*

Ans: \_\_\_\_\_

**(11 marks)**

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11. (a) A Maths test is made up of **20 questions** each carrying equal marks. Jeremy earned a mark of **65%** in this test. How many questions did Jeremy answer correctly?

Ans: \_\_\_\_\_ questions

11. (b) Pamela bought an electric drill at **85% of the cost price**. She paid €32.89 for the drill. What was the original cost price? (**Round to the nearest cent**)

Ans: €\_\_\_\_\_

(4 marks)

12. Continue the table below by using trial and improvement methods to solve the equation  $x^3 - 2x = 33$ . Give the answer correct to **one decimal place**.

$x$	$x^3$	$2x$	$x^3 - 2x$	<i>small/large</i>
$x = 2$	8	4	$8 - 4 = 4$	<i>too small</i>

Ans:  $x =$  \_\_\_\_\_

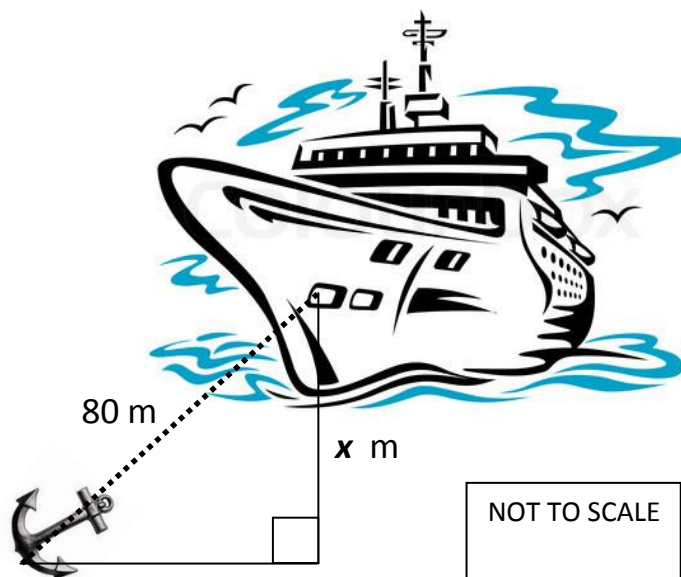
(4 marks)

13.

- (a) A cruise liner is anchored using an anchor cable of length 80 m as shown in the diagram.

The length of the vertical line,  $x$ , of the triangle shown in the diagram, is 80% of the length of the cable.

Work out the value of  $x$ .



Ans = \_\_\_\_\_ m

- (b) The cruise liner sailed a distance of 150 km in 3 hours. Then changed direction and sailed another distance of 220 km in the next 4 hours. Calculate its average speed for the whole voyage. Give your answer correct to 2 decimal places.

Ans = \_\_\_\_\_ km/hr

(6 marks)

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**END OF EXAM**