

# KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2014/2015

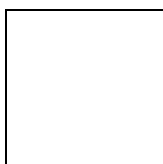
Track 2

FORM 4

**MATHEMATICS** Track 2

TIME: 20 mins

Non Calculator Paper



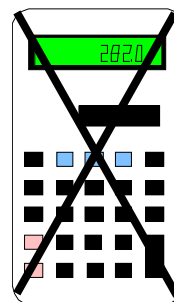
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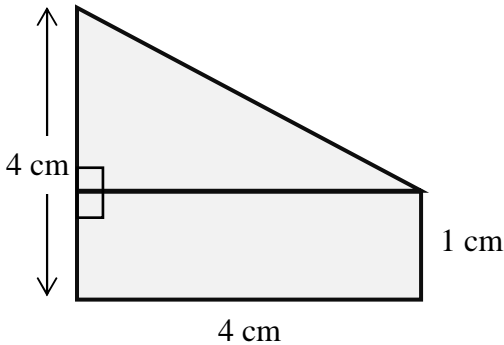
NAME AND SURNAME: \_\_\_\_\_ CLASS: \_\_\_\_\_

## INSTRUCTIONS TO CANDIDATES:

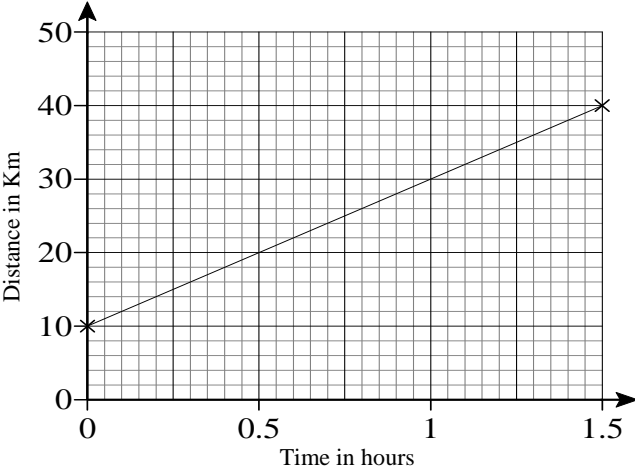
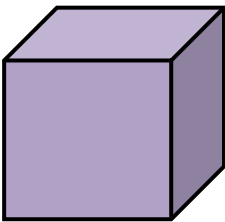
Read all the questions carefully before you start answering.

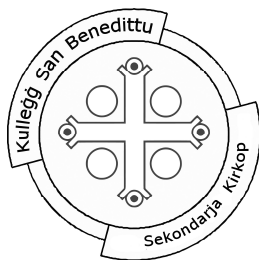
- Answer all questions.
- This paper carries 20 marks.
- **Calculators, protractors** and other mathematical instruments are **NOT ALLOWED**.
- You are not required to show your working. However, space for working is provided if you need it.



No.	Question	Space for working if required
1.	Express $\frac{145}{200}$ as a fraction in its lowest terms.  Ans: _____	
2.	Work out:  $\frac{2}{5} + 2\frac{1}{3} - 1\frac{1}{2}$  Ans: _____	
3.	Estimate: $\left(\frac{5.91 \times 6.16}{8.86}\right)^2$  Ans: _____	
4.	Write $6.7 \times 10^{-3}$ as an ordinary number.  Ans: _____	
5.	Find the value of $3a^2 - 2b$ when $a = 2$ and $b = -6$ .  Ans: _____	
6.	<p>The shape below is made up of a rectangle and a right-angled triangle. Find its perimeter.</p>  <p style="text-align: center;">4 cm</p> <p style="text-align: right;">1 cm</p> <p style="text-align: center;">4 cm</p> <p style="text-align: right;">Ans: _____ cm</p>	

7.	<p>Arrange in order, starting from the <b>smallest</b>:</p> $\frac{20}{7}, \pi, 2.4, -2$ <p>Ans: _____</p>	
8.	<p>Evaluate:</p> $10 + 2(8 - 3)$ <p>Ans: _____</p>	
9.	<p>Write down the <b>10<sup>th</sup> term</b> in the sequence:</p> $t, \frac{t^3}{2}, \frac{t^5}{3}, \frac{t^7}{4}, \dots$ <p>Ans: _____</p>	
10.	<p>The <b>circumference</b> of a circle is 30 cm. Estimate the value of its radius. (<i>Hint: Take <math>\pi</math> as 3</i>).</p> <p>Ans: <math>r =</math> _____ cm</p>	
11.	<p>Simplify:</p> $\frac{24 - 2n}{2}$ <p>Ans: _____</p>	
12.	<p>Expand and simplify:</p> $(3x^4)^2$ <p>Ans: _____</p>	
13.	<p>On a plan, the length of a room is 2.75 cm. The plan has a scale of 1 cm : 2 m. Find the real length of the room.</p> <p>Ans: _____ m</p>	
14.	<p>Write down a <b>fraction</b> that lies between 0.4 and 0.7.</p> <p>Ans: _____</p>	

15.	<p>Make <math>x</math> the subject of the formula:</p> $ax + 7 = b$ <p>Ans: <math>x =</math> _____</p>	
16.	<p>Write down <b>all</b> the prime numbers between 20 and 35.</p> <p>Ans: _____</p>	
17.	<p>Which of the numbers below is <b>equal</b> to <math>2^{-1}</math>?</p> <p>A. <math>5 \times 10^{-1}</math>      B. 0.2      C. <math>\frac{2}{10}</math></p> <p>Ans: _____</p>	
18.	<p>The distance-time graph shows the road trip of a motorcyclist during his journey to work.</p>  <p>What is his <b>average speed</b>?</p> <p>Ans: _____ km/hr</p>	
19.	<p>A <b>prism</b> has a volume of <math>225 \text{ cm}^3</math>. Its cross-sectional area is <math>25 \text{ cm}^2</math>. Find the length of the prism.</p> <p>Ans: _____ cm</p>	
20.	<p>Find the <b>total surface area</b> of a cube of sides 10 cm.</p>  <p>Ans: _____ <math>\text{cm}^2</math></p>	



# KULLEGG SAN BENEDITTU

## Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2014/2015

Track 2

FORM 4

**MATHEMATICS** Track 2

TIME: 1hr 40 mins

### Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Main	NC	Global Mark
Max. Mark	6	4	7	4	4	4	5	8	7	5	8	5	6	7	80	20	100
Mark																	

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NAME AND SURNAME: \_\_\_\_\_ CLASS: \_\_\_\_\_

### INSTRUCTIONS TO CANDIDATES:

Read all the questions carefully before you start answering.

- Answer all questions.
- This paper carries 80 marks.
- Calculators and mathematical instruments are allowed but all necessary working must be shown.

1. **Evaluate**, giving your answer correct to 1 decimal place.

a)  $(3.14 + 6.01)^3$

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

b)  $\sqrt{\frac{8.6 \times 3.9}{4.1}}$

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

c)  $3(2\pi)^2$

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

(6 marks)

2. Complete this table.

Fraction	Decimal
$\frac{1}{2}$	
	0.35
$1\frac{1}{10}$	
	$0.\dot{3}$

(4 marks)

3. On average, a car uses 1 litre of petrol to travel a distance of 6.5 km.  
A full tank holds 54 litres of petrol.

a) How many kilometres can a car travel with a **full tank**?



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

b) i) Tony visits his mother who lives **338 km away**. How many litres of petrol are required to drive to his mother's house?

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

ii) If petrol costs **€1.44 per litre** how much does Tony spend on petrol, when he drives to his mother's house? Give your answer correct to the nearest euro.

Ans: €\_\_\_\_\_

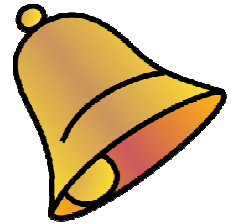
(7 marks)

Name of Student: \_\_\_\_\_ Class: \_\_\_\_\_

4. a) Work out the value of  $(2.1 \times 10^8) \div (7 \times 10^3)$ , giving your answer in **standard form**.

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

b) The bells at St. Mary's church ring every 15 minutes while the bells at St. George's church ring every 20 minutes. If the two bells both **ring together at 6.00 a.m.**, at what time will they next ring together?



Ans: \_\_\_\_\_ a.m.  
(4 marks)

5. Twelve men take 15 days to finish a job if each man works 8 hours a day. If the same job has to be finished in 10 days, find the **total number of extra hours per day** that these 12 men work **altogether**.



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

6. a) **Fill in:**

i)  $\frac{5^7 \times 5^{-2}}{5^3} = 5^{\square}$

ii)  $101^{\square} = 1$

b) **Simplify:**

$$6x^3 \times 4x^4 \div 8x^2$$

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

7. The formula for converting a temperature in degrees Fahrenheit to degrees Celsius is given by the formula:

$$C = \frac{5}{9}(F - 32)$$

- a) A fridge should have a temperature of  $41^{\circ}\text{F}$ . **Convert**  $41^{\circ}\text{F}$  into  $^{\circ}\text{C}$ .

Ans: \_\_\_\_\_  $^{\circ}\text{C}$

- b) The ideal freezer temperature in which to store food safely and stop bacteria from forming is  **$0^{\circ}\text{F}$  or colder**. Sandra's freezer is showing a temperature of  $-15^{\circ}\text{C}$ . Will bacteria form on the food in her freezer? Show all your working.



Ans: YES ☐ NO ☐  
(5 marks)

8. a) **Simplify**  $5x + 8 + 4y - 3(2 + 4x)$

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

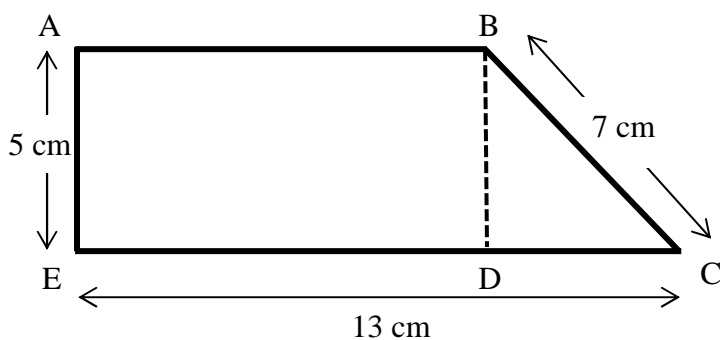
- b) **Simplify**  $\frac{5x+6}{4} - \frac{3x}{12}$

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

- c) **Solve**  $3(x - 5) = 5x - 7$

Ans:  $x =$  \_\_\_\_\_  
(8 marks)

9. Trapezium ABCE is right-angled at A and E.



*Diagram not drawn to scale.*

- a) i) What is the length of side BD? Ans: \_\_\_\_\_ cm  
 ii) Hence calculate the length of side DC, giving your answer correct to 2 significant figures.

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

- b) Find the area of the trapezium ABCE, correct to 2 decimal places.

Ans: \_\_\_\_\_  $\text{cm}^2$   
 \_\_\_\_\_ (7 marks)

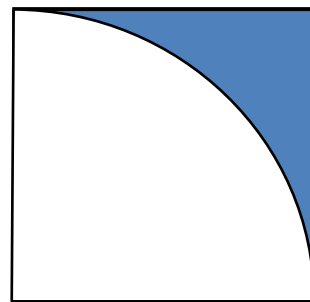
10. (a) Write the numbers 104 and 234 as **products of their prime factors**.

Ans:  $104 =$  \_\_\_\_\_;  $234 =$  \_\_\_\_\_

- (b) Hence, work out the **Least Common Multiple** of 104 and 234.

Ans: L.C.M. = \_\_\_\_\_  
 \_\_\_\_\_ (5 marks)

11. The diagram shows a **square** tile of side 45 cm. The pattern on the tile consists of a white **quarter** circle touching the edges of the square.



45 cm

Ans: \_\_\_\_\_  $\text{cm}^2$

- b) Calculate the area of the shaded part of the tile, giving your answer to the nearest  $\text{cm}^2$ .

Ans: \_\_\_\_\_  $\text{cm}^2$

- c) Find the **least** number of square tiles needed to cover a floor 9 m by 3.6 m.

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

\_\_\_\_\_ (8 marks)

12. A cylindrical hole of radius 1 cm and 6 cm deep, is drilled in a cylindrical block of wood with radius 13 cm and height 25 cm, as shown in the diagram below.

What is the **volume of the remaining wood**? Give your answer correct to the nearest  $\text{cm}^3$ .

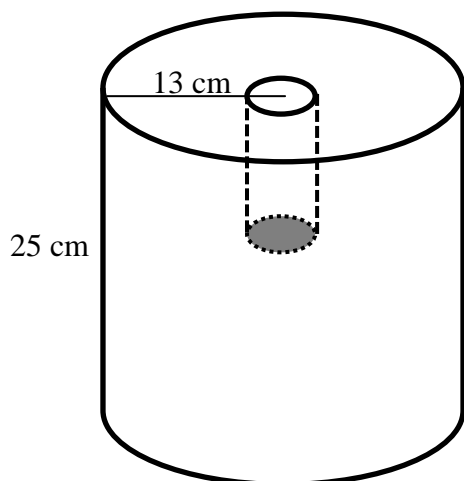
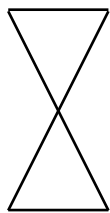


Diagram not drawn to scale.

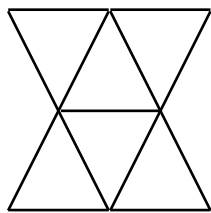
Ans: \_\_\_\_\_  $\text{cm}^3$

\_\_\_\_\_ (5 marks)

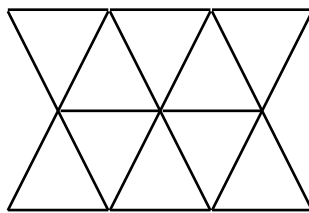
13. Paul makes fences using identical wooden rods each **one metre long**.  
Some fences with different lengths are shown below.



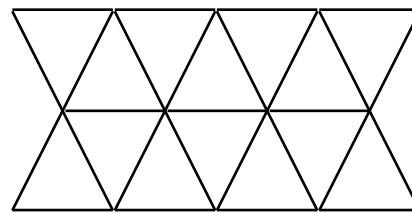
Length = 1 m



Length = 2 m



Length = 3 m



Length = 4 m

The table below shows the number of rods used for various lengths of fence.

Length (metres)	1	2	3	4	...	6
Number of Rods	6	13	20	<i>a</i>	...	<i>b</i>

- a) Write down the values of *a* and *b*.

Ans: *a* = \_\_\_\_\_, *b* = \_\_\_\_\_

- b) Find an expression for the  $n^{\text{th}}$  term.

Ans:  $n^{\text{th}}$  term = \_\_\_\_\_

- c) Paul has 400 rods. How many **complete** fences of length 6 m can he make?

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

(6 marks)

14. From church A, the bearing of church B is  $060^\circ$ .  
Church C is 75 km due east of church A and 41 km due south of church B.
- a) Draw a scale drawing to show the position of the three churches.  
Use a scale of 1 cm to represent 10 km.



- b) Use your diagram to calculate:
- i) the actual distance, in km, of church B from church A.

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

- ii) the bearing of church A from church B.

Ans: \_\_\_\_\_  
°

(7 marks)

**END OF PAPER**