

KULLEĠĠ SAN BENEDITTU

Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2015/2016

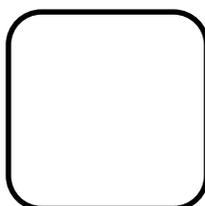
Track 2

FORM 4

MATHEMATICS Track 2

TIME: 20 mins

Non Calculator Paper

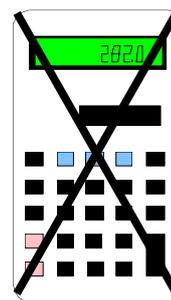


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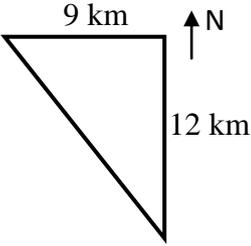
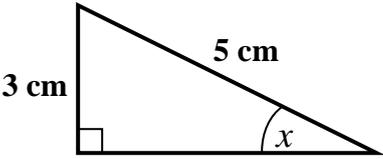
NAME AND SURNAME: _____ CLASS: _____

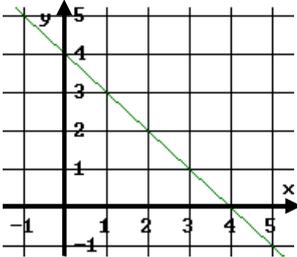
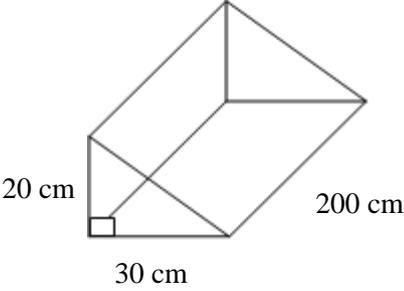
INSTRUCTIONS TO CANDIDATES:

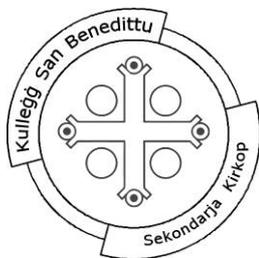
- Answer all questions.
- This paper carries 20 marks.
- **Calculators and protractors are NOT ALLOWED.**



No.	Question	Space for working, if required.
1	Find the missing number $3^{\square} \times 3 = 3^{10}$ Ans: _____	
2	Write down all the prime numbers between 15 and 30. Ans: _____	
3	Estimate the value of: 27.8×9.3 Ans: _____	
4	Sandra planted 80 pumpkin seeds, but only 20 of them grew into plants. What fraction of the seeds grew? Give your answer in its simplest form. Ans: _____	
5	A recipe uses 25 g of flour to make 10 biscuits. How many biscuits can be made from 1kg of flour? Ans: _____	
6	Find the value of x if $4^x = 64$ Ans: _____	
7	Write down the value of b given that: $6.2 \times 10^b = 0.00000062$ Ans: _____	

8	Simplify: $xy - y^2 + 5xy + 3y^2 - 2$ Ans: _____	
9	Which of the following is equivalent to $2k^2 + 6k$ A. $2(k^2 + 6k)$ B. $2k(k + 3k)$ C. $2k(k + 3)$ D. $6(2k^2 + k)$ Ans: _____	
10	Make p the subject of the formula: $m = 3p + 2$ Ans: _____	
11	A plane flies 12 km due north of a runway, then changes course and flies 9 km west. How far is the plane from the runway?  Ans: _____ km	
12	Write down the value of $\sin \theta$.  Ans: _____	
13	Estimate the circumference of circle whose diameter is 10 cm. Ans: _____ cm	
14	The base of a triangle is 8 cm. The height is 6 cm. What is the area of the triangle? Ans: _____ cm^2	

<p>15</p>	<p>Which of the equations below describes the straight line graph shown in the diagram?</p> <p>A. $y = x + 4$</p> <p>B. $x + y = 4$</p> <p>C. $y = x - 4$</p> <p>D. $y = 4x$</p>  <p>Ans: _____</p>	
<p>16</p>	<p>A cuboid with breadth 3 cm and height 5 cm has a volume of 150 cm^3. What is the length of the cuboid?</p> <p>Ans: _____ cm</p>	
<p>17</p>	<p>Work out the volume of this solid.</p>  <p>Ans: _____ cm^3</p>	
<p>18</p>	<p>Use the information given below to determine the value of 13.8×536.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $1.38 \times 536 = 739.68$ </div> <p>Ans: _____</p>	
<p>19</p>	<p>Work out the value of the expression given below, giving your answer as an ordinary number</p> $5^{-1} \times 1250$ <p>Ans: _____</p>	
<p>20</p>	<p>Which two of the following numbers have the same value?</p> <p>$\frac{2}{3}$, 66% , $0.\dot{6}$, 6.7</p> <p>Ans: _____</p>	



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HALF YEARLY EXAMINATION – 2015/2016

Track 2

FORM 4

MATHEMATICS Track 2

TIME: 1 hr 40 mins

Main Paper

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

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NAME AND SURNAME: _____ CLASS: _____

INSTRUCTIONS TO CANDIDATES:

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

1. (a) Use your calculator to work out the value of:
$$\frac{738 \times 19}{(593 + 392)}$$

Give your answer correct to **3 significant figures**.

Answer: _____

(b) Use estimation to check your answer in (a). Show each step of your working.

Answer: _____

(4 marks)

2. (a) Expand and simplify: $3(2 - x) - 2(x - 1)$

Answer: _____

(b) Factorise: $6xy + 8xz + 4x$

Answer: _____

(c) Simplify:

(i) $5x \times 3x^2$

(ii) $\frac{18 + 12b}{3}$

Answer: _____

Answer: _____

(7 marks)

3. (a) Write these numbers in standard form.

(i) $5720 =$ _____

(ii) $0.000621 =$ _____

(b) Calculate giving your answer in **standard form**.

$$(3 \times 10^4) + (2 \times 10^5)$$

Answer: _____

(4 marks)

4. (a) Simplify the following. Give your answers in **index form**.

(i) $a^2 \div a^{-4} =$ _____

(ii) $(m^4)^{-2} \times (m^3)^5 =$ _____

(iii) $y^6 \times y^{14} \div y^5 =$ _____

(b) Fill in with the appropriate inequality sign:

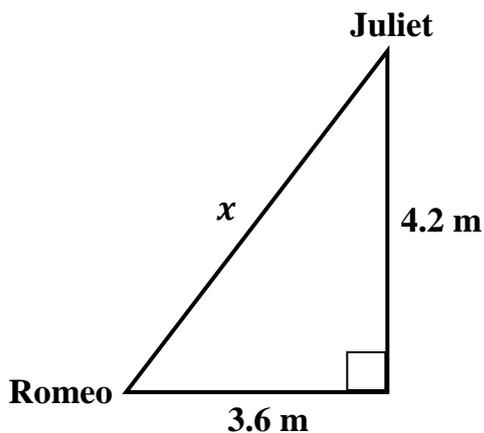
(i) 10^2 2^{10}

(ii) 3^4 4^3

(5 marks)

5. Juliet is on the balcony and Romeo is looking at her from the garden. Below is a diagram of the scene.

(a) Find **the length, x metres**, from Romeo's eyes to Juliet's eyes. Give your answer correct to **2 decimal places**.



Answer: _____ m

(b) Find the **angle of elevation** of Juliet's eyes from Romeo's eyes. Give your answer correct to the nearest degree.

Answer: _____

(4 marks)

6. (a) (i) Change 4.05 m^3 to cm^3 .

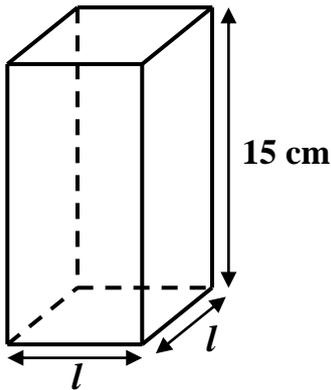
Answer: _____ cm^3

(ii) Now, write your answer for part (i) in standard form.

Answer: _____ cm^3

(b) A box has a square base. Its **height** is **15 cm** and has a **volume** of **1500 cm^3** .

Calculate the **length** of a side of the base.



Answer: _____ cm

(7 marks)

7. This is the recipe for **16 lemon muffins**.

<u>Ingredients</u>		
➤ 260 g flour	➤ 200 g sugar	➤ 1 teaspoon vanilla extract
➤ 230 g unsalted butter	➤ 4 eggs	➤ Zest and lemon juice of 1 lemon

(a) Alessia is a chef. She is doing this recipe. How much **sugar** does she need to make **30 muffins**?

Answer: _____ g

(b) Alessia used **1170 g** of **flour**. How many muffins did she make?

Answer: _____ muffins

(4 marks)

8. Consider the formula $k = 4m + 5n$

(a) Find k when $m = 3$ and $n = -2$.

Answer: _____

(b) **Rearrange** the formula to make n the subject of the formula.

Answer: _____

(c) John is working out the following. He wants to substitute $k = 11$ and $n = -5$ in the following equation:

$$\frac{k - 5n}{4} = m$$

The following is his working. Can you find his mistake?

Work out the correct answer.

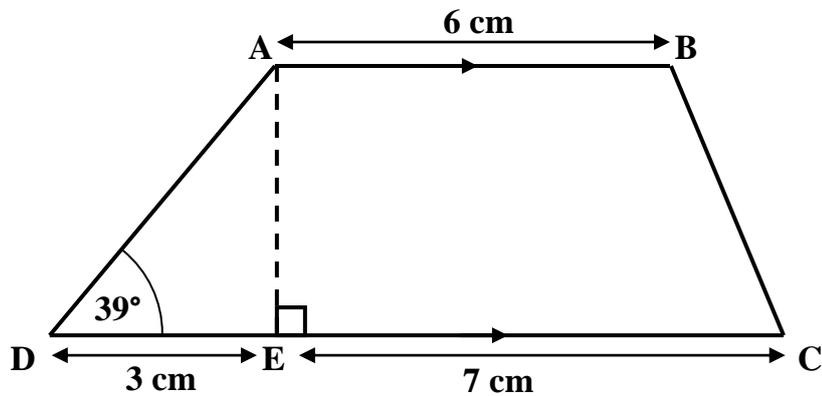
<u>John's Working</u>	
	$\frac{k-5n}{4} = m$
Step 1:	$\frac{11-5(-5)}{4} = m$
Step 2:	$\frac{11-25}{4} = m$
Step 3:	$-\frac{14}{4} = m$
Step 4:	$-3.5 = m$

<u>Correct Working</u>

Incorrect Step: _____, Correct Answer: _____

(7 marks)

9. In the figure below, AB is parallel to DC, angle ADC = 39°, angle AEC = 90°, AB = 6 cm, DE = 3 cm and EC = 7 cm.



- (a) Calculate correct to **2 decimal places**, the length of AE and AD.

Answers: AE: _____ cm

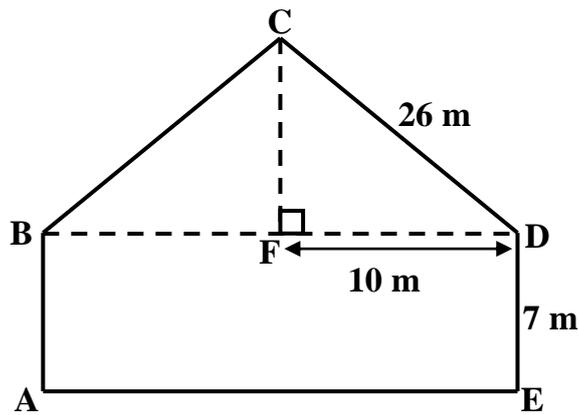
AD: _____ cm

- (b) Calculate correct to **3 significant figures**, the area of the trapezium ABCD.

Answer: _____ cm²

(10 marks)

10. The diagram below shows a cross-section of a greenhouse made up of an isosceles triangle BCD and a rectangle ABDE.



- (a) Work out **CF**.

Answer: _____ m

- (b) Work out **angle BCD**, correct to the **nearest degree**.

Answer: _____^o

- (c) Work out the **area of the cross-section ABCDE**.

Answer: _____ m²

(8 marks)

11. A solid metal cylinder has a **diameter** of **10 cm** and a **height** of **20 cm**.

(a) Work out the **curved surface area** of the cylinder.

Give your answer correct to **3 significant figures**.

Answer: _____ cm²

(b) Calculate the **volume** of the cylinder.

Give your answer correct to **3 significant figures**.

Answer: _____ cm³

The cylinder is melted down and the resulting metal is all used to make a cube.

(c) Find the **length** of one edge of the cube.

Give your answer correct to **1 decimal place**.

Answer: _____ cm

(10 marks)

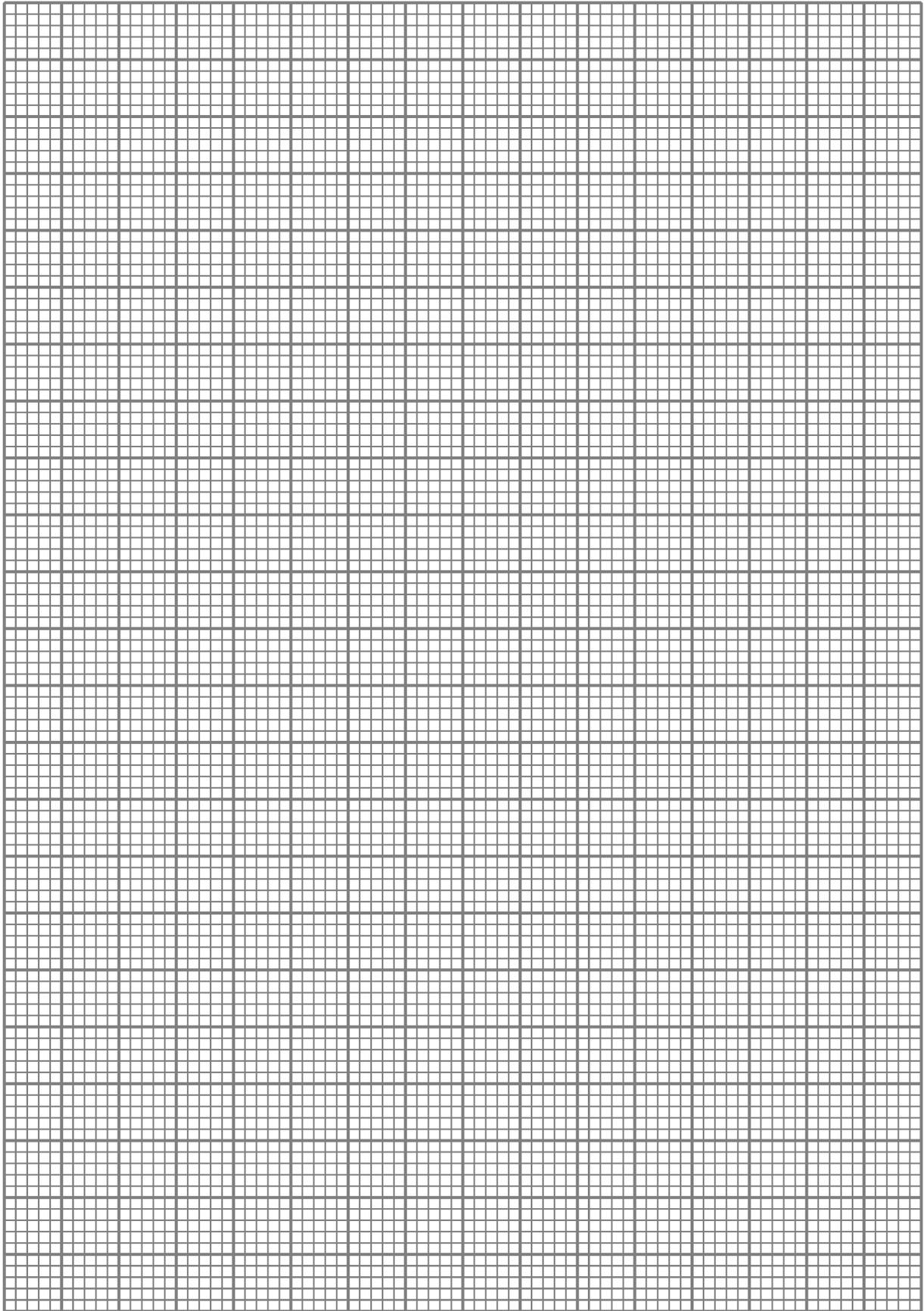
12. (a) Complete the table for $y = x^2 - 2$ for values of x from -3 to 3 .

x	-3	-2	-1	0	1	2	3
x^2		4		0		4	9
-2	-2			-2		-2	-2
y			-1		-1	2	7

(b) Using a scale of 2 cm to represent 1 unit on the x -axis and 1 cm to represent 1 unit on the y -axis, plot the graph of $y = x^2 - 2$, on the graph paper.

(c) Use your graph to solve the equation $x^2 - 2 = 4$.

Answer: $x = \underline{\hspace{2cm}}$ or $x = \underline{\hspace{2cm}}$
(10 marks)



END OF MAIN PAPER
