

# KULLEĠĠ SAN BENEDITTU

## Secondary School, Kirkop

Mark

### HALF YEARLY EXAMINATION – 2015/2016

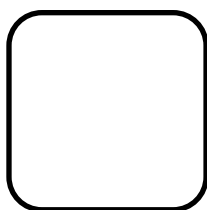
Track 3

FORM 4

MATHEMATICS Track 3

TIME: 20 mins

Non Calculator Paper

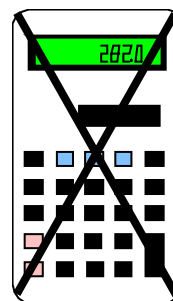


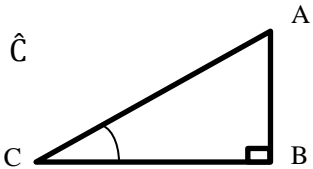
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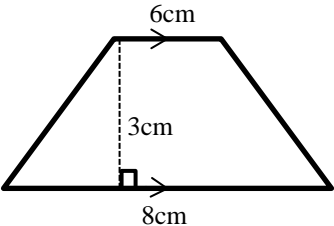
NAME AND SURNAME: \_\_\_\_\_ CLASS: \_\_\_\_\_

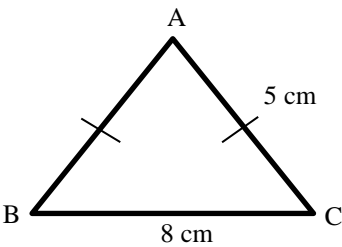
#### INSTRUCTIONS TO CANDIDATES:

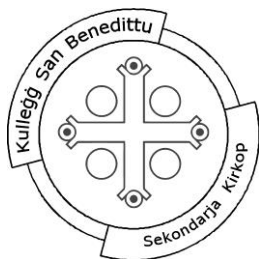
- Answer all questions.
- This paper carries 20 marks.
- **Calculators and protractors are NOT ALLOWED.**



No.	Question	Space for working, if required.
1	Evaluate, giving your answer as a <b>mixed number</b> . $3^2 + 2^{-3}$ Ans: _____	
2	Calculate, giving your answer in <b>standard form</b> : $\frac{5 \times 10^8}{2.5 \times 10^3}$ Ans: _____	
3	Simplify: $\frac{20x^2y^5}{2xy^{-1}}$ Ans: _____	
4	Find $x$ : $3^x = \frac{1}{9}$ Ans: _____	
5	Evaluate: $13.7 \times 7 + 13.7 \times 3$ Ans: _____	
6	Factorise: $9x^2 - 16$ Ans: _____	
7	If $\tan \hat{C} = \frac{5}{12}$ , find $\sin \hat{C}$  Ans: _____	

8	<p>I have a bag of marbles which I can share equally among 2, 3 and 7 children. What is the least number of marbles that I can have in the bag?</p> <p>Ans: _____ marbles</p>	
9	<p>Make <b>r</b> subject of the formula:</p> $V = \pi r^2 h$ <p>Ans: _____</p>	
10	<p>Write down the equation of a line passing through the points (0,2) and (3,5)</p> <p>Ans: _____</p>	
11	<p>The volume of a prism is <math>280 \text{ cm}^3</math>. Find the area of the cross-section if the length is 14 cm.</p> <p>Ans: _____ <math>\text{cm}^2</math></p>	
12	<p>A book costs €25 and is sold at €10. Work out the percentage loss.</p> <p>Ans: _____ %</p>	
13	<p>What sum of money is invested to get a simple interest of €50 at 5% p.a. for 5 years?</p> <p>Ans: € _____</p>	
14	<p>Work out the area of this shape.</p>  <p>Ans: _____ <math>\text{cm}^2</math></p>	

15	<p>Work out <math>6 \times 3^2 + 2</math></p> <p>Ans: _____</p>	
16	<p>Factorise: <math>x^2 + 5x - 6</math></p> <p>Ans: _____</p>	
17	<p>What is the height of the triangle?</p>  <p>Ans: _____ cm</p>	
18	<p>Give the gradient of the line whose equation is</p> $2y - 5 = 8x$ <p>Ans: _____</p>	
19	<p>Which fraction is <b>not equivalent</b> to 0.3?</p> <p><math>\frac{3}{10}</math> , <math>\frac{1}{3}</math> , <math>\frac{6}{20}</math> , <math>\frac{15}{50}</math></p> <p>Ans: _____</p>	
20	<p>Write down the Logo Commands using the <b>repeat command</b> to draw a <b>square of side 50 turtle steps</b>.</p> <p>Ans: _____</p>	



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HALF YEARLY EXAMINATION – 2015/2016

Track 3

FORM 4

**MATHEMATICS** Track 3

TIME: 1 hr 40 mins

### Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Main	NC	Global Mark
Max. Mark	5	6	3	3	9	6	5	6	8	6	8	6	9	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) Express 154 and 165 as a product of their prime factors.

Ans:  $154 =$  \_\_\_\_\_

$165 =$  \_\_\_\_\_

- b) Hence or otherwise find (i) the LCM and (ii) the HCF of 154 and 165.

Ans: (i) LCM = \_\_\_\_\_

(ii) HCF = \_\_\_\_\_

(5 marks)

2. The table below shows the number of English speaking persons in a number of countries.

Country	Number of English speakers
Australia	$1.52 \times 10^7$
Canada	$1.77 \times 10^7$
Jamaica	$2.4 \times 10^6$
New Zealand	$3.2 \times 10^6$
USA	$2.25 \times 10^8$
UK	$5.68 \times 10^7$
Guyana	$4.8 \times 10^5$

- a) Which of these countries has the largest number of English speakers?

\_\_\_\_\_

- b) Which country has an English speaking population of almost half a million?

\_\_\_\_\_

- c) What is the difference in the number of English speakers between USA and UK?  
(Give your answer in standard form).

\_\_\_\_\_

- d) List the countries in order, start with the country having the **least** number of English speakers.

\_\_\_\_\_

(6 marks)

3. The population of a town grows by 13% in one year and by 16% in the next year. What is the overall percentage increase?

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

(3 marks)

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

Track 3

4. Convert:

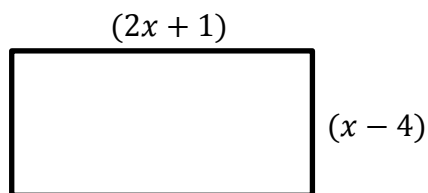
a)  $2500 \text{ cm} = \text{_____ km.}$

b)  $536 \text{ cm}^2 = \text{_____ m}^2$

c)  $35 \text{ m}^3 = \text{_____ cm}^3$

(3 marks)

5. a)



i) Write down an expression for the area of the rectangle.

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

ii) Given that  $x = 10 \text{ cm}$ , find the area of the rectangle.

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

b) Factorise fully i)  $3x^2 - 6x$

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

ii)  $25x^2 - 81y^2$

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

iii)  $3p^2 + 12p - 36$

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

(9 marks)

6. The price of a house increases by 15% each year. The value of a house in 2015 was €150,000.

a) What was the value of the house in 2014 correct to the nearest €1000?

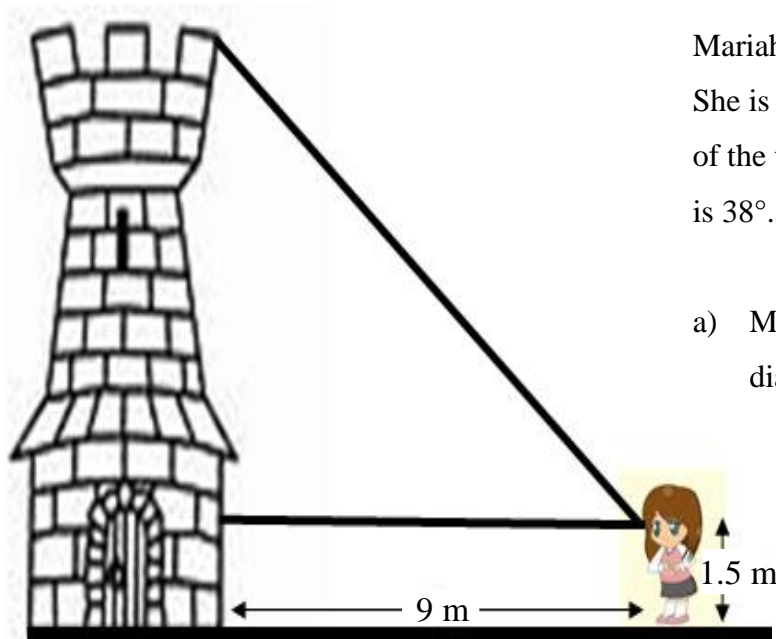
Ans: \_\_\_\_\_

b) What will the value of the house be in 2016?  
(Do NOT round your answer).

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

(6 marks)

7.



Mariah is standing 9 m away from a tower. She is 1.5 m tall and the angle of elevation of the top of the tower from Mariah's eyes is  $38^\circ$ .

a) Mark the angle of elevation on the diagram.

b) Find the height of the tower correct to 3 significant figures.

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

c) Mariah gets closer to the tower. What happens to the angle of elevation?

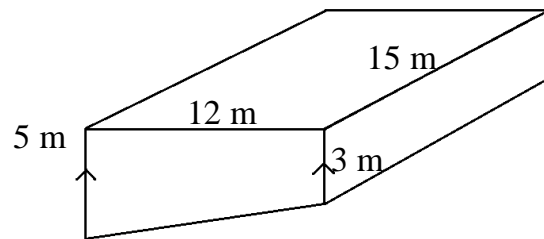
\_\_\_\_\_

(5 marks)



8. A pool has the cross-section in the form of a trapezium.

a) Find the area of cross-section.



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

b) The length of the pool is 15 m. Work out the volume of the pool.

Ans: \_\_\_\_\_ m<sup>3</sup>

c) How many litres of water are needed to fill the pool?

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

(6 marks)

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9. Make  $x$  the subject of the formula:

a)  $x(a - b) = 3$

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

b)  $x^2y = a$

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

c)  $\sqrt{bx} = c$

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

d)  $ax + t = rt + bx$

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

(8 marks)

10. Mr Millionaire inherited €720,000,000. He is going to invest:

\* half of the sum of money at 5% p.a. simple interest for five years

\* the remaining half of the sum of money at 2% p.a. compound interest for 5 years

Find the total interest gained after 5 years.

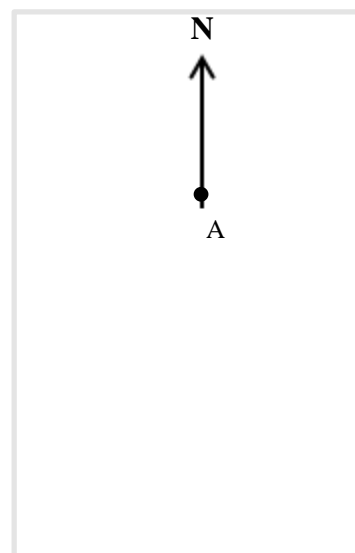
Ans: \_\_\_\_\_

(6 marks)

11. Mark starts from point A. He walks a distance of 5 km West and then 13 km South to point B.

a) Continue the rough sketch to show Mark's journey.

b) Mark walks back from B to A. Calculate the distance AB correct to 1d.p.



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

c) Find the bearing of B from A. Give your answer to the nearest degree.

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

(8 marks)

12. The formula for the area of a trapezium can be written as  $A = \frac{(a + b)h}{2}$

a) Make  $a$  the subject of the formula.

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

b) Find the value of length  $a$  given that a trapezium has an area of  $25 \text{ cm}^2$ , its height  $h$  is  $5 \text{ cm}$  and length  $b$  is  $3 \text{ cm}$ .

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

(6 marks)

13. a) Complete the table for  $y = 2x + 5$  for the values of  $x$  from  $-3$  to  $3$ .

$x$	$-3$	$-2$	$-1$	$0$	$1$	$2$	$3$
$2x$							
$+5$							
$y$							

b) Plot the graph of  $y = 2x + 5$  using a suitable scale.

c) Use the graph to find:

i) the value of  $x$  when  $y = 6$

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

ii) the value of  $y$  when  $x = 0.2$

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

d) Which one of the following lines is parallel to the graph with equation  $y = 2x + 5$  ?

A)  $2x + 2y = \frac{1}{2}$

B)  $y + 2x = 8$

C)  $y - 2x = 7$

(9 marks)

