

KULLEĠĠ SAN BENEDITTU

Secondary School, Kirkop

HALF YEARLY EXAMINATION – 2014/2015

Track 3

FORM 4

MATHEMATICS Track 3

TIME: 20 mins

NAME: _____ INDEX NO. _____ Class: _____

Non Calculator Paper

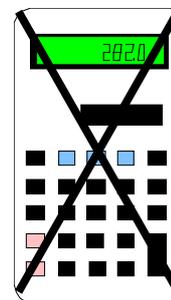
Mark

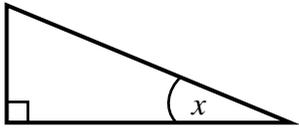
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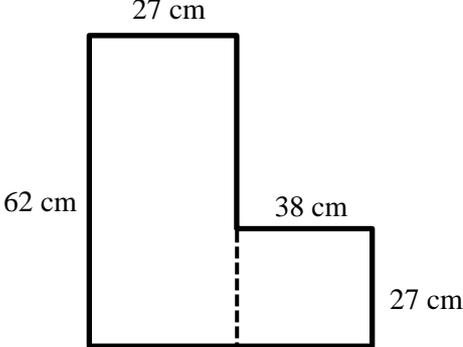
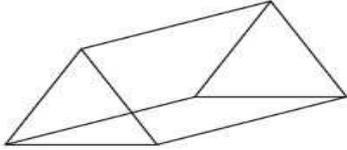
INSTRUCTIONS TO CANDIDATES:

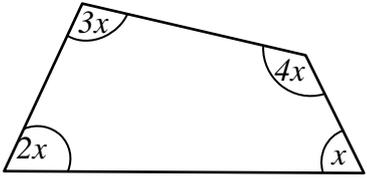
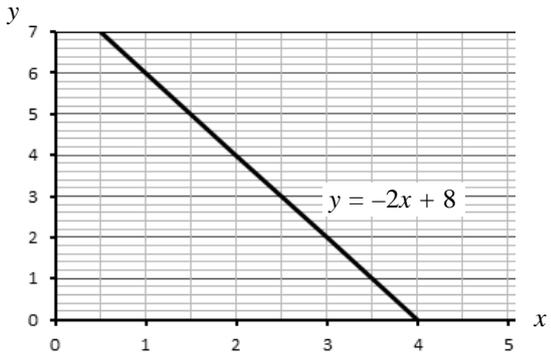
Read all the questions carefully before you start answering.

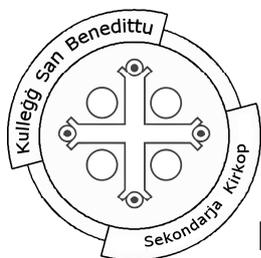
- Answer all questions.
- This paper carries 20 marks.
- **Calculators, protractors** and other mathematical instruments are **NOT ALLOWED**.
- On your desk you should have nothing except for **pen, pencil, ruler** and the **examination paper**.
- You are not required to show your working. However, space for working is provided if you need it.



No.	Question	Space for working, if required.
1	<p>The product of an odd number and an even number is:</p> <p>A) either odd or even B) always even C) always odd D) sometimes odd</p> <p>Ans: _____</p>	
2	<p>Make s subject of the formula:</p> $v^2 = u^2 + 2as$ <p>Ans: _____</p>	
3	<p>Work out and simplify: $\frac{7}{4^2} + \frac{1}{2^4}$</p> <p>Ans: _____</p>	
4	<p>Write down a fraction that lies between $\frac{1}{4}$ and $\frac{2}{4}$.</p> <p>Ans: _____</p>	
5	<p>Estimate: $\left(\frac{5.57 \times 8.43}{3.86}\right)^2$</p> <p>Ans: _____</p>	
6	<p>At the Sliema ferry, ships leave every 20 minutes and boats leave every 15 minutes. The first ship and the first boat leave at 6:00 am. At what time will the ship and boat next leave together?</p> <p>Ans: _____</p>	
7	<p>$\cos x = \frac{4}{5}$</p> <p>Work out the value of $\sin x$.</p>  <p>Ans: _____</p>	
8	<p>The area of a square is equal to that of a rectangle with sides 4 cm by 9 cm. What is the length of one side of the square?</p> <p>Ans: _____ cm</p>	

9	<p>Work out: $\sqrt{0.0025}$</p> <p style="text-align: right;">Ans: _____</p>	
10	<p>Write 72.3 million in standard form.</p> <p style="text-align: right;">Ans: _____</p>	
11	<p>2.5 kg of seeds cover 10 m^2. How many kilograms of seed are needed to cover 140 m^2?</p> <p style="text-align: right;">Ans: _____ kg</p>	
12	<p>Work out the overall percentage increase when an increase of 10% is followed by an increase of 10%.</p> <p style="text-align: right;">Ans: _____</p>	
13	<p>What is the Highest Common Factor (HCF) of 252 and 2^4 ?</p> <p style="text-align: right;">Ans: _____</p>	
14	<p>Work out the area of this shape.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">Ans: _____ cm^2</p>	
15	<p>The cross section of this prism is a triangle with base 8 cm and perpendicular height 5 cm. The prism has a volume of 200 cm^3. What is the length of the prism?</p> <div style="text-align: center;">  </div> <p style="text-align: right;">Ans: _____ cm</p>	

16	<p>The sum of three consecutive numbers is 93. What are the three numbers?</p> <p style="text-align: right;">Ans: _____, _____, _____.</p>	
17	<p>Calculate the value of the smallest angle in this quadrilateral.</p>  <p style="text-align: right;">Ans: _____ °</p>	
18	<p>Work out the difference between 10% of €4985 and 10% of €985.</p> <p style="text-align: right;">Ans: _____</p>	
19	<p>The graph shows the line $y = -2x + 8$. On the same axes plot the graph $y = 2x$ and solve the simultaneous equations.</p>  <p style="text-align: right;">Ans: $x =$ _____; $y =$ _____</p>	
20	$B = \frac{W}{h^2}$ <p>W and h are a person's weight (kg) and height (metres), respectively.</p> <p>A healthy person has the value of B between 20 and 25.</p> <p>Mark is 1.2 m tall and is healthy.</p> <p>Write down a possible value for his weight.</p> <p style="text-align: right;">Ans: _____ kg</p>	



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Mark

HALF YEARLY EXAMINATION – 2014/2015

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FORM 4

MATHEMATICS Track 3

TIME: 1hr 40 mins

NAME: _____ INDEX NO. _____ Class: _____

Main Paper

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

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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. a) Express in the form 2^n :

i) $128 = 2^{\square}$

ii) $\frac{1}{16} = 2^{\square}$

(b) Simplify, giving your answer in the form a^n :

i) $\frac{(a^5)^2 \times a^{12}}{a^{11}}$

ii) $\frac{a^6}{a^{-3}} \times \frac{a^0}{a^4}$

Ans: _____

Ans: _____

(6 marks)

2. a) Expand and simplify $(x + y)(x - 2y)$

Ans: _____

b) Solve $5^{x-4} = 25$

Ans: $x =$ _____

(4 marks)

3. This spreadsheet shows the prices for a flight to Brussels, offered by different airline companies. It is used to work out currency conversions and compare prices.

	A	B	C	D
1	Airline	Flight Number	British Pound (£)	Euro (€)
2	/	/	1	1.25
3	Maltawings	KM1612		110.25
4	Rowenair	RA332	95.90	
5	East-jet	EJ 2212		103.13

a) Fill in the missing **values** in the table. Give your answers correct to **2 decimal places**.

b) The **formula** typed in cell C3 is: = _____

c) Which airline is **cheapest**? _____

(5 marks)

4. Convert:

a) $77\,000\text{ cm}^3 =$ _____ litres

b) $6\,750\,000\text{ cm}^3 =$ _____ m^3

c) $0.7\text{m}^2 =$ _____ cm^2

(3 marks)

5. Light travels 9.4608×10^{12} km in 1 year.
One year is equivalent to 5.256×10^5 minutes.

- a) Light takes 434 years to travel from the star Polaris to Earth. How many **kilometres** is Polaris away from Earth? Give your answer in **standard form** correct to **3 significant figures**.

Ans: _____ km

- b) The distance from earth to the sun is about 150 million kilometres. How long will it take for light to travel this distance? Give your answer **correct to the nearest minute**.

Ans: _____ minutes

(5 marks)

-
6. a) Factorise:

i) $16 - r^2$

Ans: _____

ii) $x^2 - 5x - 24$

Ans: _____

- b) Make ***n*** subject of the formula:

$$6(n + m) = 3(n - m)$$

Ans: $n =$ _____

(6 marks)

7. a) Kristie buys some office furniture at €1066.50, including VAT.
If VAT is set at **18.5%**, what is its price before VAT?

Ans: €_____

- b) The population of a village **increased by 10%** in the first year and **another 10%** in the second year. It then **decreased by 10%** in the third year. The initial population of the village was 6000.

- (i) Work out the population after three years.

Ans: _____ people

- (ii) Work out the overall percentage increase.

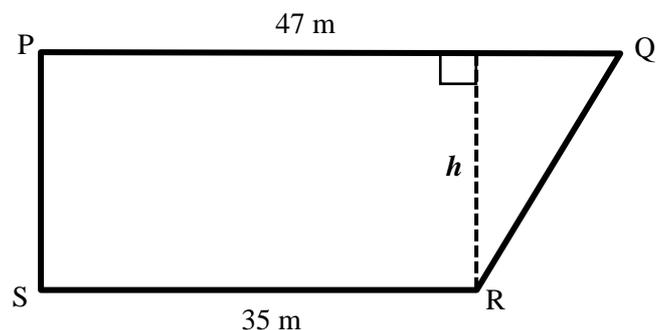
Ans: _____%

(7 marks)

8. The diagram shows a trapezium PQRS. $PQ = 47$ m and $RS = 35$ m.

The area of the trapezium is 902 m^2

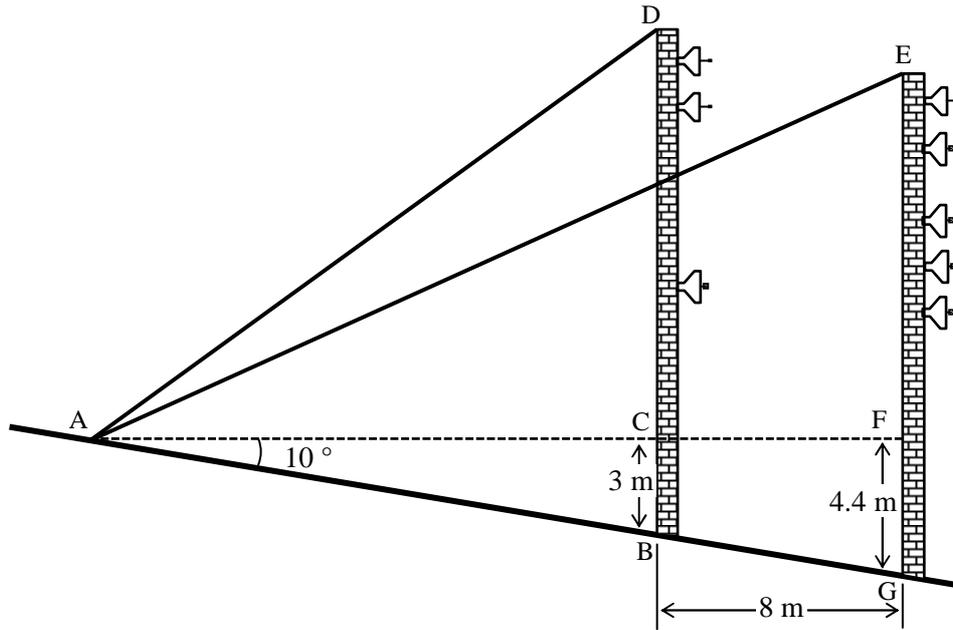
Work out the perpendicular height h .



Ans: _____ m

(3 marks)

9. Two vertical identical aerial towers BD and GE are each **17 metres high** and are 8 metres apart. The cables DA and EA are used for support. The angle of depression of both B and G from A is 10° .



Work out, correct to 1 decimal place:

- a) the distance AC ;

Ans: _____ m

- b) the angle DAC ;

Ans: _____
°

- c) the angle EAF ;

Ans: _____
°

- d) the length of the longer cable, AE .

Ans: _____ m

(10 marks)

10. Toni invested €48 000 with compound interest. The rate of interest for the first year was **4%** while for the second year interest was paid at a rate of **3.5%**.

i) Calculate the final **amount** of money at the end of the second year.

Ans: €_____

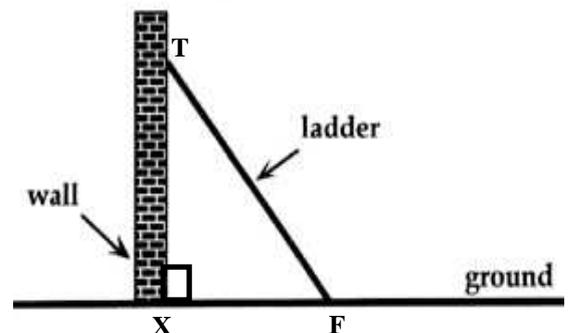
ii) At the end of the second year €16 667.20 was **withdrawn**. The rest of the money continued to be invested. The rate of interest for the third and fourth years was **r %**. The final amount at the end of the fourth year was €36 556.94.
Work out the value of **r** .

Ans: **r** = _____%

(7 marks)

11. TF is a ladder **5 metre** long. It is placed on a horizontal ground, leaning against a vertical wall TX. The distance FX is **1.5 m**.

a) Calculate TX. Give your answer correct to **2 decimal places**.



Ans: _____ m

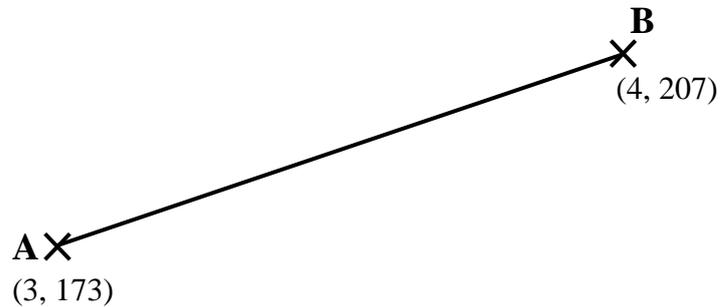
b) Can you form a right angled triangle with sides **10 cm**, **49.5 cm** and **50.5 cm**?
Show your working clearly.

Ans: YES NO

(5 marks)

12. Below is part of a linear graph used to work out the cost, €, of hiring cars, for x days. This cost is made up of a **fixed charge** plus a **charge per day**.

Hiring a car for 3 days costs €173 while hiring it for 4 days costs €207.



- a) Work out **the gradient** of the line AB where A is (3, 173) and B is (4, 207).

Ans: _____

- b) Work out **the y-intercept** (the fixed charge) of the line graph.

Ans: _____

- c) What is the **equation of the line**?

Ans: _____

- d) Use **your answer in part c)** to calculate the cost of hiring the car for **1 week**.

Ans: € _____

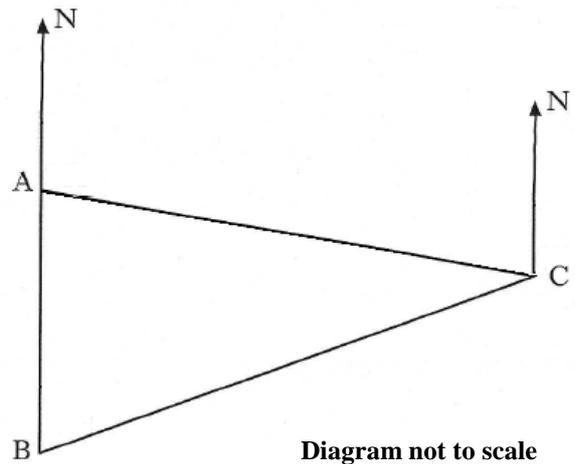
(7 marks)

13. Ships A and B are out at sea and sail towards a fixed point C. Ship A is due north of B and sails on a bearing of 110° at an average speed of **56 km per hour**. Ship B sails on a bearing of **080°** .

After **3 hours** both ships arrive at C.

- a) On the diagram mark, by writing down its value, the bearing of:

- (i) C from A
(ii) C from B



- b) Work out the distance **AC**.

Ans: _____ km

- c) How far **west** is A from C? Give your answer correct to 3 decimal places.

Ans: _____ km

- d) Work out the distance **BC**, correct to the nearest km.

Ans: _____ km

- e) Which ship has the faster speed? Give a reason for your answer.

(12 marks)

END OF EXAM

