

KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2017/2018

Track 3

Year 10

MATHEMATICS
Non Calculator Paper

TIME: 20 mins

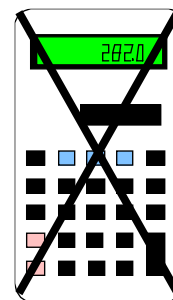
NAME: _____

CLASS: _____

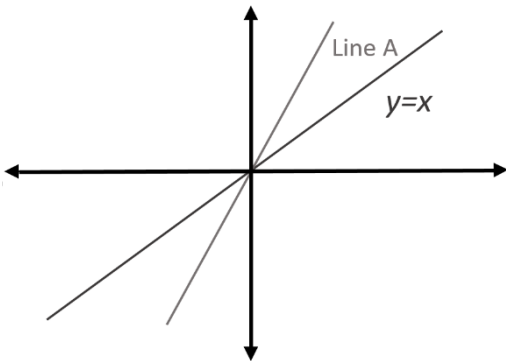
Mark

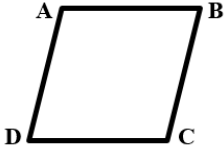
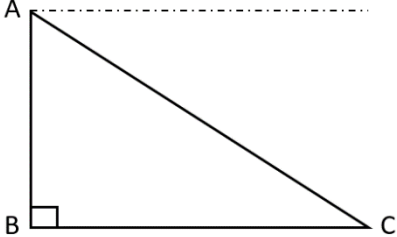
Instructions to Candidates

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

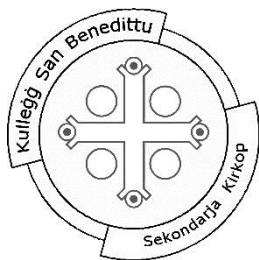


No.	Question	Space for working, if required
1	<p>The area of a triangle is 48 cm^2. The base is 12 cm. Find its height.</p> <p style="text-align: right;">Ans: _____</p>	
2	<p>Simplify leaving your answer in index form:</p> $\frac{2^3 \times 2^4}{2^9}$ <p style="text-align: right;">Ans: _____</p>	
3	<p>Evaluate $48^2 - 18^2$.</p> <p style="text-align: right;">Ans: _____</p>	
4	<p>Work out giving your answer in standard form.</p> $\frac{4.8 \times 10^2}{1.2 \times 10^{-3}}$ <p style="text-align: right;">Ans: _____</p>	
5	<p>Given that $\tan x = 0.75$, find the value of $\cos x$.</p> <p style="text-align: right;">Ans: _____</p>	
6	<p>Find the value of a.</p> $\frac{x^3 \times x^a}{x^5} = 1$ <p style="text-align: right;">Ans: _____</p>	
7	<p>Increase €80 by 25%.</p> <p style="text-align: right;">Ans: _____</p>	
8	<p>A container has a volume of 4500 cm^3. How many litres can this cylinder hold when full?</p> <p style="text-align: right;">Ans: _____</p>	
9	<p>Find the value of $999 \times 87 + 87$.</p> <p style="text-align: right;">Ans: _____</p>	

10	<table><tr><th>Height h in cm</th><th>Frequency</th></tr><tr><td>$150 < h \leq 160$</td><td>5</td></tr><tr><td>$160 < h \leq 170$</td><td>3</td></tr><tr><td>$170 < h \leq 180$</td><td>2</td></tr></table>	Height h in cm	Frequency	$150 < h \leq 160$	5	$160 < h \leq 170$	3	$170 < h \leq 180$	2					
	Height h in cm	Frequency												
	$150 < h \leq 160$	5												
	$160 < h \leq 170$	3												
	$170 < h \leq 180$	2												
Circle the correct answer. The table above is an example of: A) discrete data B) continuous data C) ungrouped data														
11	Change 2.5 m^2 to cm^2 . Ans: _____													
12	$(-1)^n = -1$ Write down a possible value for n if n is greater than 1. Ans: _____													
13	<div><p>diagram NOT drawn to scale</p></div> Write a possible value for the gradient of Line A. Ans: _____													
14	<table><tr><td>Number of mobiles</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Frequency</td><td>10</td><td>21</td><td>42</td><td>8</td><td>9</td></tr></table> Students were asked to state the number of mobile phones they owned over a period of 2 years. How many students owned less than 3 mobiles in this survey? Ans: _____	Number of mobiles	0	1	2	3	4	Frequency	10	21	42	8	9	
Number of mobiles	0	1	2	3	4									
Frequency	10	21	42	8	9									

15	<p>ABCD is a rhombus. $AB = 2x$ and $BC = (x + 5)$. Find the value of x.</p> <p style="text-align: right;">Ans: _____</p>	
16	<p>For the following equation, write down a set of possible values for x and y:</p> $4^x = 8^y$ <p style="text-align: right;">Ans: $x =$ _____; $y =$ _____</p>	
17	 <p>Which of the statements below is true?</p> <p>A. The angle of elevation of A from C is greater than the angle of depression of C from A.</p> <p>B. The angle of elevation of A from C is smaller than the angle of depression of C from A.</p> <p>C. The angle of elevation of A from C is equal to the angle of depression of C from A.</p> <p style="text-align: right;">Ans: _____</p>	
18	<p>The n^{th} term of a sequence is $4n+1$. Which term is equal to 65?</p> <p style="text-align: right;">Ans: _____</p>	
19	<p>Which of the following statements is false?</p> <p>A. 5 is a multiple of 25</p> <p>B. 5 is a factor of 25</p> <p>C. 5 is both a prime number and an odd number</p> <p style="text-align: right;">Ans: _____</p>	
20	<p>Find the total surface area of a cube with sides 4 cm long.</p> <p style="text-align: right;">Ans: _____</p>	

END OF NON-CALCULATOR PAPER



KULLEĠĠ SAN BENEDITTU Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2017/2018

Track 3

Year 10	MATHEMATICS Main Paper	TIME: 1 hr 40 mins
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Question	1	2	3	4	5	6	7	8	9	10	11	12	Total Main	Non Calc	Global Mark
Mark															

DO NOT WRITE ABOVE THIS LINE

NAME: _____

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.

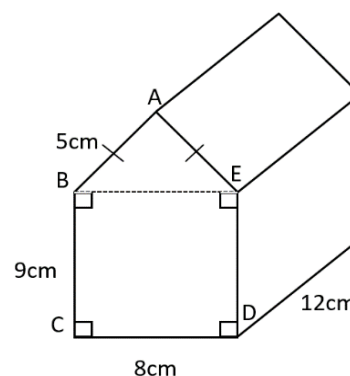
1. The diagram shows a compound prism.

a. Find the area of the cross-section ABCDE.

Ans: _____ cm²

b. Hence find the volume of the prism.

Ans: _____ cm³



(5 marks)

2. a. Express 60 and 108 as a product of their prime factors.

Ans: $60 =$ _____ $108 =$ _____

- b. The rectangular floor of a doll's house has dimensions 60 cm by 108 cm. Identical square tiles are used to cover the floor of the doll's house. Only whole tiles are used. What is the largest possible size of the tile?

Ans: _____

(3marks)

3. A motorbike depreciates by 8% each year.

- a. In **January** 2013, Andrea bought a motor bike for €6500.
Calculate the value of the motor bike at the end of **December** 2017.
Give your answer **correct to the nearest Euro**.

Ans: _____

- b. Calculate the overall percentage decrease of the motor bike after these five years.

Ans: _____

(5 marks)

Name: _____

Class: _____

4. WXYZ is a trapezium. WX is parallel to YZ and WZ is the perpendicular height of the trapezium. All measurements are in centimetres.

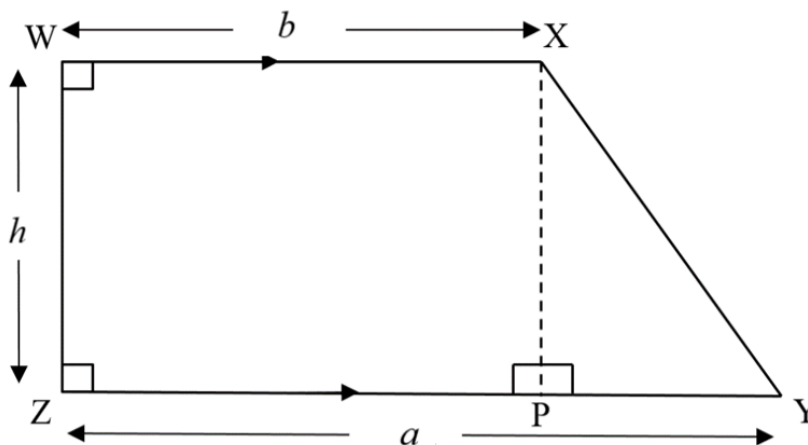


Diagram NOT drawn to scale.

- a. Express the area of rectangle WXPZ in terms of b and h .

Ans: _____

- b. Express the area of triangle PXY in terms of a , h , and b .

Ans: _____

- c. Hence show that the area A of trapezium WXYZ is given by:

$$A = \frac{h(a+b)}{2}$$

- d. Find the area of trapezium WXYZ when $a = 20$ cm, $b = 12$ cm and $h = 6$ cm.

Ans: _____ cm^2

(5 marks)

5. The equation of line L1 is $y = 2x + 5$.

- a.** L1 intersects the x-axis at point A and the y-axis at point B.
Find the co-ordinates of point A and point B. (Hint: draw a sketch.)

Ans: $A = (\quad , \quad)$ and $B = (\quad , \quad)$

- b.** The equation of another line L2 is $y = 5x + 4$.
Write down the gradient of line L2.

Ans: _____

- c.** A third line L3 is parallel to line L2 and passes through the point (2, 9).
Write down the equation of line L3.

Ans: _____

(6 marks)

6. a. Factorize completely the following expressions.

i. $4xy + 20x^2$

ii. $x^2 + 5x - 14$

iii. $3x^2 - 48$

iv. $2x^2 + x - 3$

b. Expand and simplify.

i. $5 - 2(3 - x)$

ii. $(x - 5)(3x - 4)$

iii. $(2x + 1)(2x - 1)$

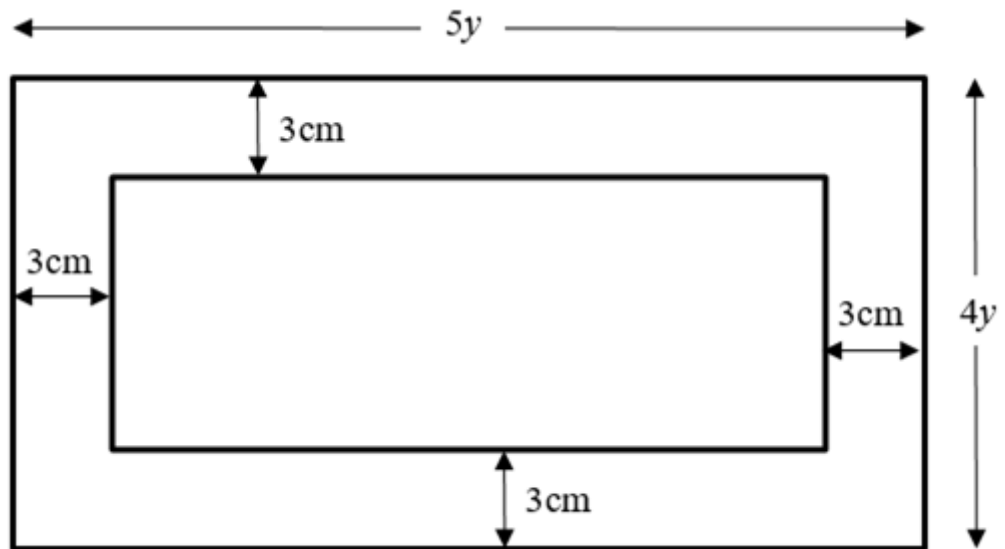
iv. $4(3x + 1) - 2(x + 5)$

(13 marks)

Name: _____

Class: _____

7.



The diagram shows a rectangular wooden frame 3cm wide all around. The outer measurements of the frame are $5y$ cm and $4y$ cm.

a. Show that the expression for the inner perimeter of the frame is $18y - 24$.

b. The inner perimeter of the frame is 66 cm.

Write down an equation in terms of y and solve it to find the value of y .

Ans: _____

c. Hence, work out the values of the outer measurements of the frame.

Ans: _____ cm; _____ cm

(6 marks)

8. A sequence starts with the following four terms

5, 7, 9, 11, ...

a. i) Write down the next two terms of the sequence. Ans: _____, _____

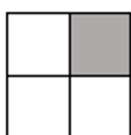
ii) Determine the expression for the n^{th} term of the sequence.

Ans: _____

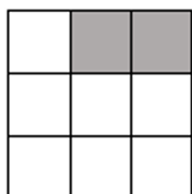
iii) Calculate the 180th term of the sequence.

Ans: _____

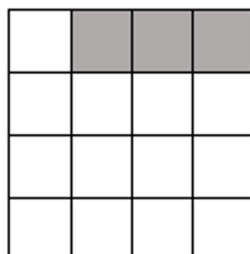
b. Look at the following pattern:



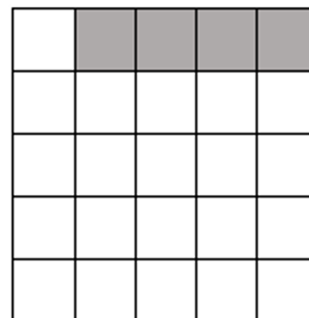
Shape 1



Shape 2



Shape 3



Shape 4

i. Complete the table below:

Shape number	1	2	3	4	5		12		n
Total number of squares	4	9	16						
Number of black squares	1	2	3						
Number of white squares	3	7	13						

ii. Which shape number has a total of 100 squares?

Ans: _____

iii. How many white squares are there in shape 70?

Ans: _____

(11 marks)

9. The table below shows the age of a group of people working in a factory.

22	35	48	36	47	31	41	30
56	37	24	35	50	38	23	61
62	48	33	49	60	42	63	40

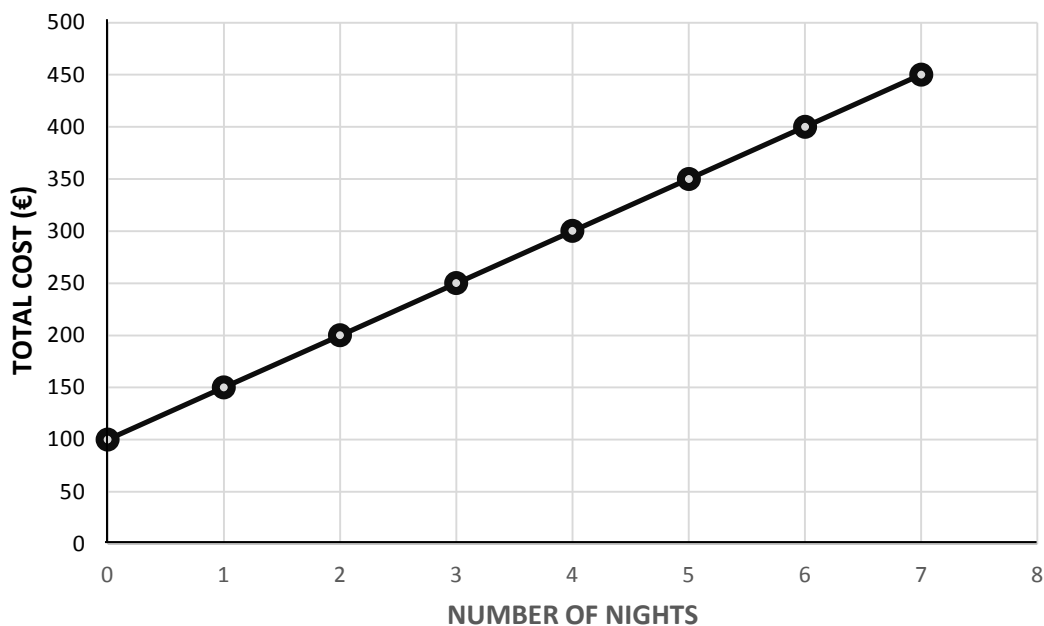
a. Use the information to fill in the table below.

Age n in years	Tally	Frequency
$20 \leq n < 30$		
$30 \leq n < 40$		
$40 \leq n < 50$		
$50 \leq n < 60$		
$60 \leq n < 70$		

b. Draw a histogram to illustrate the above data.

(5 marks)

- 10.** The total cost of a holiday in Spain consists of the cost of the flight and the cost of the hotel according to the number of nights spent. The graph shows how the total cost changes with the number of nights.



- a.** Find the gradient of the line.

Ans: _____

- b.** Circle the correct answer. The gradient of the line represents:

- i.** The cost of the flight
- ii.** The cost of one night at the hotel
- iii.** The total cost of the flight and the hotel
- iv.** The total cost of the hotel

- c.** What does the y-intercept represent?

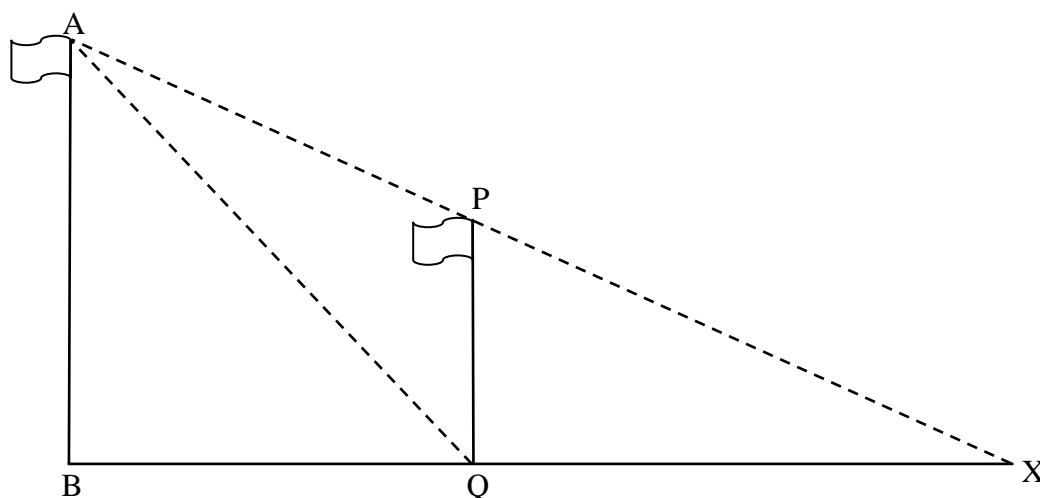
Ans: _____

- d.** Work out the total cost T of this holiday for n nights.

Ans: _____

(5 marks)

- 11.** The diagram shows two vertical flagpoles AB and PQ on a horizontal ground BQX. The angle of elevation of A from Q is 65° and the angle of depression of X from A is 34° . The flagpole AB is 5.2 m.



a) Calculate:

- i) the distance BQ;

Ans: _____

- ii) the distance BX;

Ans: _____

b) Work out the difference in height of the two flagpoles.

Ans: _____

(7 marks)

12.

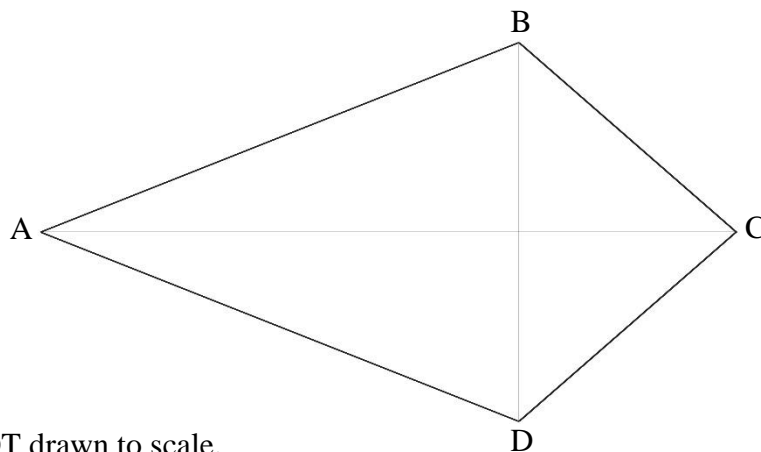


Diagram NOT drawn to scale.

ABCD is a kite. The shorter pair of sides BC and CD are 50 cm long and the longer sides AB and AD are each 80 cm long. $\angle BCD = 70^\circ$.

Work out, giving your answers correct to **3 significant figures**:

a) the length of the shorter diagonal BD;

Ans: _____

b) the length of the larger diagonal AC;

Ans: _____

c) the area of the kite.

Ans: _____

(9 marks)

END OF EXAMINATION