

KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2017/2018

Track 3

Year 9

MATHEMATICS
Non Calculator Paper

TIME: 30 mins

Question	1	2	3	4	5	6	NC
Mark							

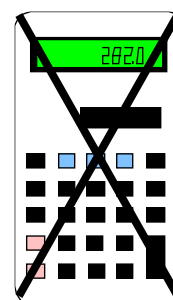
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NAME: _____

CLASS: _____

Instructions to Candidates

- Answer all questions.
- This paper carries a total of 25 marks.
- Calculators and protractors are NOT ALLOWED.



1. a) The cost price of a computer is €400. If VAT is charged at 18%, work out the **selling price** of the computer.



Ans: € _____

- b) A shopkeeper sells a camera for €200. This **includes** a profit of 25%. What is the **cost price** of the camera?

Ans: € _____

(4 marks)

2. a) The speed of light is 299,792,458 m/s.

- i) Round this number correct to 2 significant figures.

Ans: _____ m/s

- ii) Write your answer to question (a)(i) in standard form.

Ans: _____ m/s

- b) Write 3.25×10^{-4} as an ordinary number.

Ans: _____

(3 marks)

3. a) Simplify:

$$4n^9 \times 2n^{-6} = \underline{\hspace{2cm}}$$

- b) Find the value of $x - 2(y - 3z)$ when $x = 4$, $y = -0.5$ and $z = 2$.

Ans: _____

(4 marks)

4. James cycles his bicycle in the playground. The **diameter** of the bicycle's wheels are **45 cm**.

Estimate how far James has travelled if the front wheel of the bicycle makes **10 complete revolutions**. Give your answer in metres, correct to the **nearest metre**. (Take π as 3)



Ans: _____ m
(4 marks)

5. Deborah wants to visit her aunt, who lives **120 km** away. Her car travels **10 km on one litre** of petrol.

a) If five litres of petrol cost €6, work out the **cost** of this journey.

Ans: €_____

Deborah starts her journey at 9:17 a.m.

b) i) If she drives at an **average speed of 80 km/hr**, at what time does Deborah arrive at her aunt's house?

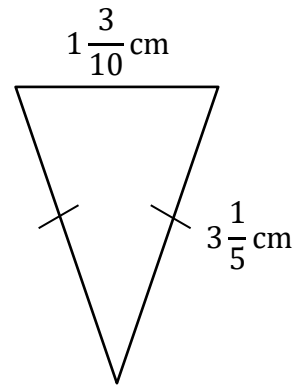
Ans: _____

ii) What happens to the time of arrival if Deborah drives at a **slower speed**?

(6 marks)

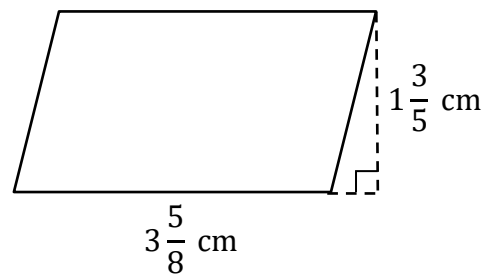
6. Work out, giving your answer as a **mixed number**:

a) the **perimeter** of this **isosceles triangle**



Ans: _____ cm

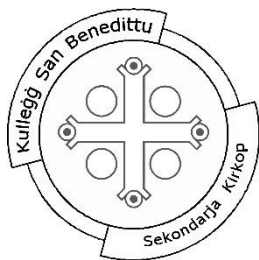
b) the **area** of this parallelogram



Ans: _____ cm²

(4 marks)

END OF NON-CALCULATOR PAPER



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HALF YEARLY EXAMINATION – 2017/2018

Track 3

Year 9	MATHEMATICS Main Paper	TIME: 1 hr 30 mins
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Question	1	2	3	4	5	6	7	8	9	10	11	Total Main	Non Calc	Global Mark
Mark														

DO NOT WRITE ABOVE THIS LINE

NAME: _____

CLASS: _____

INSTRUCTIONS TO CANDIDATES:

- Answer all questions.
- This paper carries 75 marks.
- Calculators and mathematical instruments are allowed but all necessary working must be shown.

1. a) **Round** each of the following numbers correct to **1 significant figure**:

i) $76.5 \approx$ _____

ii) $0.476 \approx$ _____

iii) $1.99 \approx$ _____

b) Use your answers to question (a) to work out an **estimate** for $\frac{76.5 \times 0.476}{1.99}$

(3 marks)

2. Anna and Maureen invest €18,000 and €30,000 respectively in a new business. Each month Anna and Maureen **share profits in the same ratio of their investment**.

a) Write the ratio €18,000 : €30,000 in its **simplest form**.

_____ : _____

b) In May, the business makes a profit of €1,600. How much does **each** get?

Anna = € _____; Maureen = € _____

c) In June, Anna receives €960. Work out the **total profit** made in June.

Total Profit = € _____

(5 marks)

3. a) Rearrange the formula $I = \frac{PRT}{100}$ to make T the subject of the formula.

T = _____

b) For **how long** must a sum of €5000 be invested at a rate of 1.5% per annum to yield an interest of €262.50?

_____ years

(4 marks)

4. a) **Factorise fully:**

i) $16x + 24y$

ii) $7m^2n^3 + mn^2$

b) **Simplify:**

i) $\frac{15k^7m^6}{25k^{10}m}$

ii) $\frac{4x^2 + 2x}{2x + 1}$

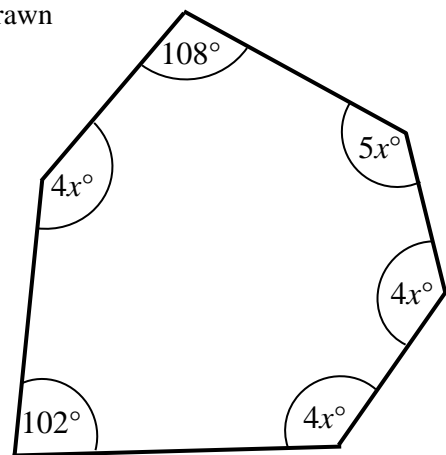
c) **Expand and simplify:**

$(x - 3)(x - 7)$

(9 marks)

5. a) Work out the value of x .

Diagram not drawn
to scale



$x =$ _____[°]

b) A **regular polygon** has one interior angle of 170° . How many sides does this polygon have?

_____ sides

(7 marks)

6. A green grocer buys crates of peaches from 2 different suppliers – Supplier A and Supplier B. There are rotten peaches in some of the crates.

The number of **rotten** peaches for Supplier A are shown below:

Number of rotten peaches	0	1	2	3	4	5	6
Supplier A	4	3	2	2	0	1	1

a) Work out, giving your answers correct to 1 d.p. where necessary.

i) the **mean** number of rotten peaches for **Supplier A**.

ii) the **median** number of rotten peaches for **Supplier A**.

iii) the **modal** number of rotten peaches for **Supplier A**.

The mean, median and mode of Supplier B are seen in the table below. Use the answers found in question (a) to **fill in the missing values for Supplier A**.

	Mean	Median	Mode
Supplier A			
Supplier B	2.6	2	2

- b) **From which supplier, A or B** should the green grocer buy peaches from?
Explain. (Use the table to help you.)

Supplier _____ because _____

 _____ (8 marks)

7. Look at the pattern below.



Pattern
1



Pattern
2



Pattern
3



Pattern
4

a) Fill in:

Pattern	1	2	3	4
No. of Triangles	3		7	

b) Find the rule for the number of triangles in **Pattern n (n^{th} term)**.

n^{th} term: _____

c) Which pattern has **79 triangles**?

Pattern _____

d) Andrea uses a spreadsheet to find the number of triangles in each pattern.

	FILE	HOME	INSERT	PAGE LAYOUT	FORMULAS	DATA
	E10	:	X	✓	f_x	
	A	B	C	D	E	F
1	Pattern No.	1	2	3	4	
2	No. of Triangles	3		7		
3						
4						

Underline the formula that she uses in cell **C2** to find the number of triangles used in Pattern 2.

(A) $=2*D1-1$

(B) $=5*C1+1$

(C) $=2*C1+1$

(6 marks)

8. The diagram shows a rubber gasket. The two small circles have a **diameter** of 4 cm, while the larger circle has a **radius** of 8 cm.

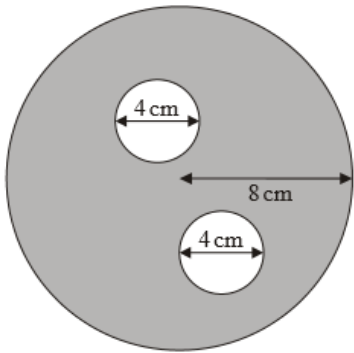


Diagram not drawn to scale

a) Calculate, giving your answers correct to 2 decimal places:

i) the area of **one** of the **smaller circles**;

_____ cm²

ii) the area of the **rubber gasket** (shaded region).

_____ cm²

b) Express the **total** area of the two smaller circles as a **percentage** of the area of the rubber gasket. Give your answer to the nearest whole number.

_____ %
(8 marks)

9. a) Use the **trial and improvement** method to solve the equation $x^3 - x = 53$.
Give your answer correct to 1 d.p.

x	x^3	$x^3 - x$	Large / Small
2	8	$8 - 2 = 6$	Small

$x =$ _____

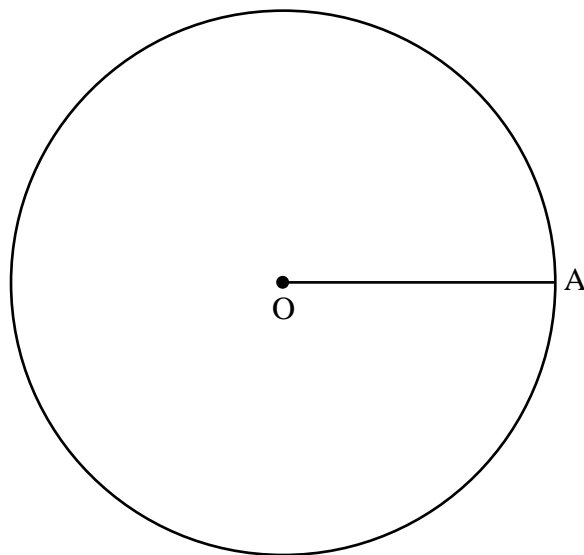
9. b) **Solve**, giving your answer as a **mixed fraction**.

$$\frac{1}{2}(3x - 5) = \frac{1}{5}(x - 4)$$

$$x = \underline{\hspace{2cm}}$$

(7 marks)

10. a) Construct **a regular pentagon ABCDE** inscribed in the circle with centre O seen below. Label your diagram.



- b) Measure side AB. AB = _____ cm

- c) A building P is in the shape of a large regular pentagon of perimeter 6 km.

The ratio, perimeter of building P : perimeter of ABCDE, is **approximately**

A) 150,000 : 1

B) 30,000 : 1

C) 1.5 : 1

Explain your choice.

(8 marks)

11.

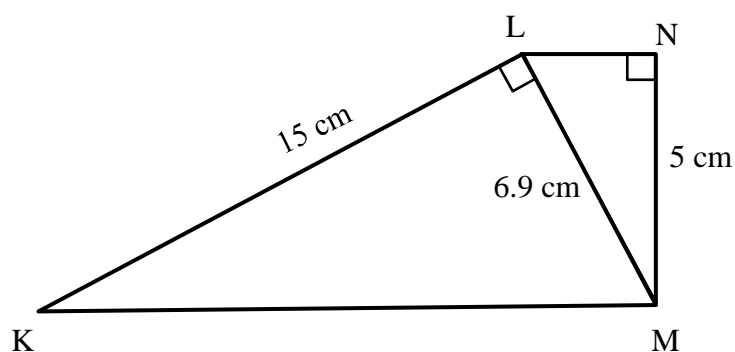


Diagram not drawn to scale

In triangle KLM, side KL is 15 cm, side LM is 6.9 cm and angle KLM is 90° . In triangle LNM, side NM is 5 cm and angle LNM is 90° .

a) Giving your answers correct to 1 d.p., find:

i) the length of side KM.

_____ cm

ii) the length of side LN.

_____ cm

b) Angle MKL is 25° and KM is parallel to LN. Work out the value of angle MLN, giving reasons for your answer.

Angle MLN = _____^o ; Reason: _____

(9 marks)

END OF MAIN PAPER