DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department of Curriculum Management
Educational Assessment Unit

Track 3

Annual Examinations for Secondary Schools 2016

FORM 3	**MATHEMATICS** Main Paper	**TIME: 1h 30min**

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calc	**Global Mark**
Mark																

DO NOT WRITE ABOVE THIS LINE

Name _____   Class _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN.
ANSWER ALL QUESTIONS.

1. The times recorded for 6 athletes in a **200 m** race are shown below.

Athlete	André	Carl	Edmond	Glenn	Isaac	Kevin
Time	21.86 s	22.15 s	21.34 s	23.29 s	24.12 s	21.46 s

a) i) Who won the race? _____

   ii) Work out his **speed** in m/s, correct to 2 significant figures.

Ans: _____ m/s

b) Calculate the **mean finishing time** for this race.

Ans: _____ s

[5 marks]

2. **Four** tennis balls, each of **diameter** 6.8 cm, fit exactly in their cylindrical container, as shown in the diagram.

a) Calculate the height of the cylinder.

Ans: _____ cm

b) Work out the **volume** of the cylindrical tube, giving your answer correct to the nearest cm³.

Ans: _____ cm³
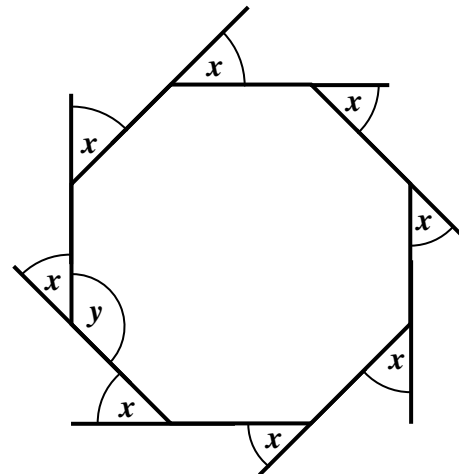
c) Write your answer to part (b) in **standard form**.

Ans: _____

[4 marks]

3. This is a **regular octagon**.

a) Fill in.

The 8 **exterior** angles, each marked x,

add up to _____ °.

b) Work out the value of y.

Ans: y = _____ °

c) Complete the LOGO commands below to draw a regular **octagon** of side 60 turtle steps.

REPEAT 8 [FD 60 RT _____]

[5 marks]

4. Alan calculates the **simple interest** payable on some investments, using a spreadsheet.

	A	B	C	D
	File Home Insert Page Layout Formulas Data Review View			
	A4 ▾ ●	f_x		
1	**Principal**	**Time (years)**	**Rate (%)**	**Simple Interest (€)**
2	2000	1.5	2	
3	2500	6	2	300
4				

a) His first entry in **Row 2** shows an investment of €2000, for $1\frac{1}{2}$ years at a rate of 2% per annum.

Underline the formula that he uses in cell **D2**, to calculate the **simple interest.**

(A) = (A2+B2+C2)/100   (B) = A2B2C2/100

(C) = (A2*B2*C2)/100   (D) = A2*B2*C2*100

b) Calculate the **simple interest** that Alan gets in cell **D2**.

*Ans: €*_____

[3 marks]

5. a) i) Write down the **first six terms** of each sequence.

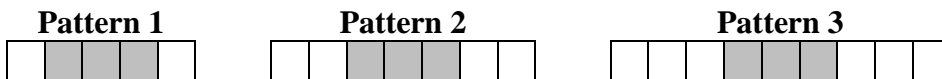| Sequence	
n^{th} term $= 3n + 1$	_____, _____, _____, _____, _____, _____
n^{th} term $= 4n - 3$	_____, _____, _____, _____, _____, _____

ii) Choose the correct answer. Show your working.

25 is a term in

(A) the sequence $3n + 1$

(B) the sequence $4n - 3$

(C) both sequences

Ans: _____

b) Here is a tile pattern.

Pattern 1 **Pattern 2** **Pattern 3**

i) Fill in the blanks.

* To get the next pattern in this sequence you have to _____

_____

* There are always _____ **middle grey tiles** in each pattern.

* The rule for the sequence of the **total** number of tiles in each pattern is:

Multiply the pattern number by _____ and _____.

ii) Write the rule for the nth term of the sequence of the **total** number of tiles.
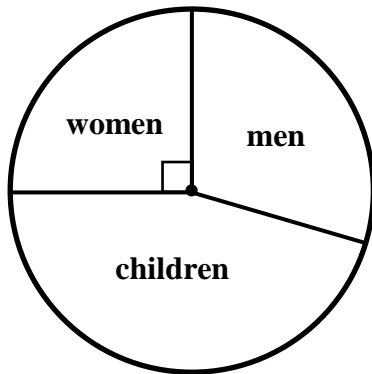
Ans: n^{th} term $=$ _____

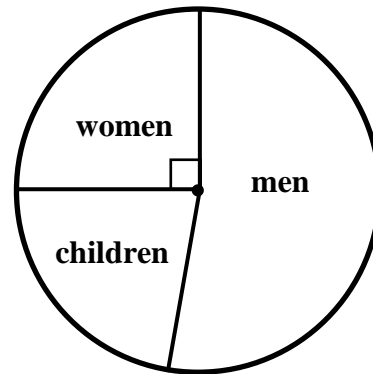[8 marks]

6.

Friday   **Saturday**

The pie charts above show the people who visited the National Art Museum on two days.

a) Tick the following statements as TRUE, FALSE or NOT SURE.

		TRUE	FALSE	NOT SURE
i)	More men than women visited the museum on Friday.			
ii)	More than half of the visitors on Friday were children.			
iii)	90% of the people visiting the museum on each day were women.			
iv)	The <u>number</u> of women visiting the museum on Friday was the same as on Saturday.			
v)	On Saturday, the number of men who visited the museum was more than double the number of women.			

b) On Saturday 72 persons visited the musuem.

Measure the respective angle in the pie chart and work out the number of children that visited the museum on Saturday.

Ans: _____ children

[7 marks]

7. Solve the following **simultaneous equations**.

$$3x - y = 13$$

$$x + 2y = 9$$

Ans: $x =$ _____ , $y =$ _____

[4 marks]

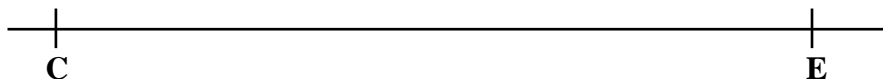8. The scale diagram below shows points C and E on level ground.
K is the position of a kite.

K
×

Scale = 1 cm : 200 m

C   E

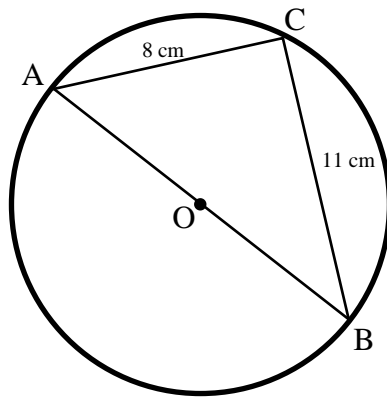a) Use the **scale diagram** above to calculate the **actual** length of **CK**, in metres.

Ans: _____ m

b) Measure the **angle of elevation** of K from E.

°

Ans: _____

[3 marks]

9. In this circle centre O, **AB is a diameter** and C is a point on the circumference.
    AC = 8 cm and CB = 11 cm.

Diagram not drawn to scale

a) Write down the size of ∠**ACB**.   Give a reason for your answer.

                    °
    Ans: _____   *Reason:* _____

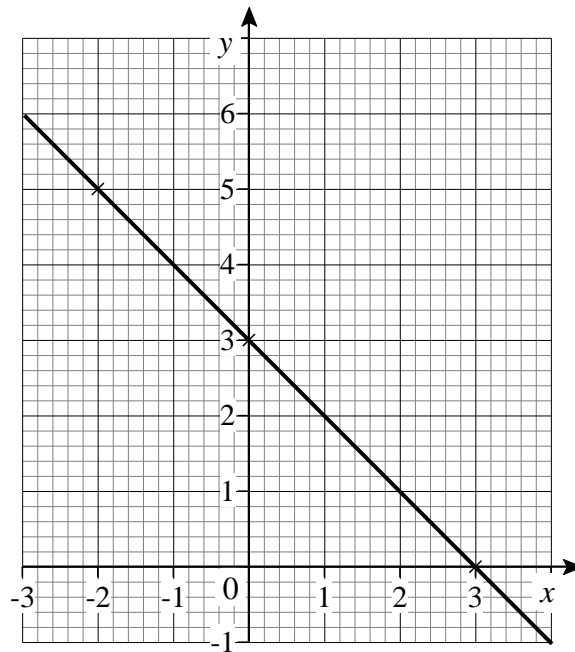b) Work out the length of **diameter AB**, giving your answer to the nearest 0.1 cm.

                                                    Ans: _____ cm

c) Calculate the value of ∠**CAB**, giving your answer to the nearest degree.

                                                                    °
                                                    Ans: _____

                                                            [7 marks]

10.

a) i) Work out the **gradient** of the line.

Ans: _____

ii) Write the **equation** of this line.

Ans: _____

b) On the **same axes** plot the line $y = 1 + x$.

c) Use your graphs to solve both equations **simultaneously**.

Ans: $x =$ _____, $y =$ _____

[7 marks]

Mathematics – Main Paper – Form 3 Secondary – Track 3 – 2016

11. a) Expand and simplify $(x + 2)(x - 5)$

*Ans:*_____

b) Factorise and simplify $\dfrac{5p^2 + 30pq}{10p}$

*Ans:*_____

c) Simplify $\dfrac{3e^5 f^2 \times 2e^2 f}{4e^4}$

*Ans:*_____

d) Make x the subject of the formula $\dfrac{x}{2} - 5 = y$

Ans: x = _____

[9 marks]

12. A shop makes **35% profit** on all mobile phones and accessories.
The **selling price** is shown on the price tag.

€270

a) The **cost price** of the headphones is €8.45.
Work out their **selling price**. Give your answer correct to the **nearest 50c**.

Ans: €_____

b) Work out the **cost price** of the mobile phone.
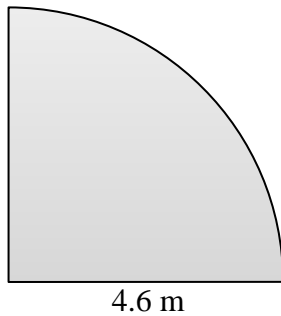
Ans: €_____

[5 marks]

13. a) A trundle wheel is used to measure distances.

One **complete revolution** of the wheel measures 1 metre.

Calculate the **radius** of the wheel. Give your answer in cm, correct to 3 significant figures.
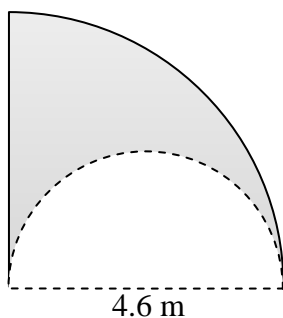
Ans: _____ cm

b) i) Work out the area of this **quarter** of a circle.
Give your answer correct to 1 decimal place.

4.6 m

Ans: _____ m^2

ii) A **semicircle** is **removed** from the above quarter of the circle as shown in the diagram below.
Work out the **shaded area**, giving your answer correct to 1 decimal place.

4.6 m

Ans: _____ m^2

[8 marks]

END OF PAPER