DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department for Curriculum Management and eLearning
Educational Assessment Unit
Annual Examinations for Secondary Schools 2012

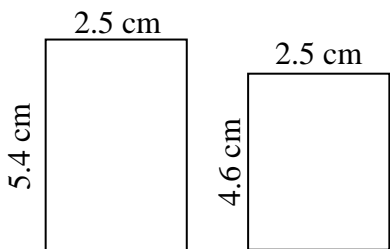| FORM 5	MATHEMATICS SCHEME A	TIME: 20 minutes
	Non Calculator Paper	

Name: _____

Class: _____

Mark

INSTRUCTIONS TO CANDIDATES

- **Answer all questions. There are 20 questions to answer.**

- **Each question carries 1 mark.**

- **Calculators, protractors and other mathematical instruments are not allowed.**

- **You are not required to show your working. However space for working is provided if you need it.**

No.	Question	Space for Working
1	A bag contains 2 kg of flour. A recipe uses 300 g of flour. Using only one bag of flour, how many times can the recipe be made? _____ times	
2	Write down the value of *n*, given that $$2^n = 32$$ *n* = _____	
3	What is the size of the **obtuse angle** between the hands of a clock at **half past ten**? _____ °	
4	VAT is charged at 18%. The cost of a sofa (without VAT) is €350. Work out the **cost** of the sofa **including VAT**. €_____	
5	Work out: $$2 - \frac{2}{5}$$ **Answer:_____**	
6	Find *p* and *q* given that $$200 = 2^p \times 5^q$$ *p* = _____ , *q* = _____	
7	The circumference of a circle is equal to 24 cm. **Underline** the best **estimate** for the radius. **A**. 4 cm **B**. 6 cm **C**. 8 cm **D**. 12 cm	

No.	Question	Space for Working
8	A sum of money is divided in the ratio 2 **:** 3 **:** 5. The smallest share is €24. What is the sum of money? €_____	
9	Find the **total area** of the two rectangles. 2.5 cm 2.5 cm 5.4 cm 4.6 cm Area = _____ cm^2	
10	A euro is approximately equal to £0**.**80. How much do I get for €250? £_____	
11	A car travels at an average speed of 60 km/h for 3½ hours. How far does it travel? _____km	
12	Given that $f(x) = 2x - 5$, work out the value of x if $f(x) = 8$. $x =$ _____	
13	**Underline** the point that passes through the line whose equation is $y = 3x - 2$. **A**(−2, −4) **B**(2, 4) **C**(2, −4) **D**(−2, 4)	
14	Work out the value of $(0.4)^2 \times 1000$. Give your answer in **standard form**. Answer:_____	

No.	Question	Space for Working
15	Four boys had to solve the equation $x^3 - x + 6 = 0$. **Underline** the correct answer. **A**. $x = -1$ **B**. $x = 1$ **C**. $x = 2$ **D**. $x = -2$	
16	**Underline** the number which is **equal** to $\frac{1}{4}$. **A**. 4% **B**. 0.4 **C**. 40% **D**. 4^{-1}	
17	**Underline** the number of **positive factors** of 12. **A.** 4 **B**. 5. **C**. 6 **D**. 7	
18	The **perimeter** of a rectangular field is 40 m. The length is three times the width. Work out the **area** of the field. Area = _____ m^2	
19	Work out the **gradient** of a line that passes through $(6, -2)$ and $(1, 8)$. Gradient = _____	
20	The bearing of B from A is 130°. Work out the **bearing** of A from B. _____°	

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A

FORM 5   **MATHEMATICS SCHEME A**   **TIME: 1h 40min**

MAIN PAPER

1	2	3	4	5	6	7	8	9	10	11	12	13	NC	Main	Total

Name: _____   **Class: _____**

**Calculators are allowed but the necessary working must be shown.
Answer all questions.**

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1   Pawlu bought a car in January 2009 for €15 600. The price of the car **decreased** by 8% in 2009 and by 12% in 2010. Work out the price of the car on 31 December 2010. Give your answer correct to the **nearest euro**.

€_____

(3 marks)

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2   Karmenu uses a spreadsheet to work out the **simple interest**.

(a)   Write the **formula** which Karmenu types in

(i)   cell B4 =_____

(ii)   cell B5 =_____

	A	B	C
1	Sum invested (€)	4600	
2	Rate (%)	3.5	
3	Time (years)	4	
4	Interest (€)		
5	Amount (€)		

(b)   What **output** will Karmenu get in **cell B5**?

€_____
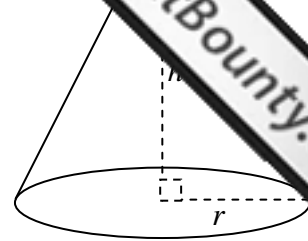
(4 marks)

3 The formula $V = \dfrac{\pi r^2 h}{3}$ is used to find the volume of a cone.

(a) Work out the **volume** of a cone when $r = 3.2$ cm and
$h = 5.7$ cm. (Give your answer correct to **3 significant figures.**)

Volume = _____ cm^3

(b) Make r the **subject of the formula**.

$r =$ _____

(4 marks)

4 The equation of a straight line, **L**, is $4x = 2y + 3$.

(a) Write down the **gradient** and the **y-intercept** of this straight line.

gradient = _____

y-intercept = _____

(b) The line passes through the point **A**$(2, b)$. Write down the value of b.

$b =$ _____

(c) Another straight line is parallel to **L** and passes through the point **B**$(0, -5)$. Write down the **equation** of this straight line.

Equation of line: _____

(5 marks)

Name: _____   Class: _____

5　(a)　Which one of these three triangles is **not similar** to the other two? **Explain**.

_____

_____
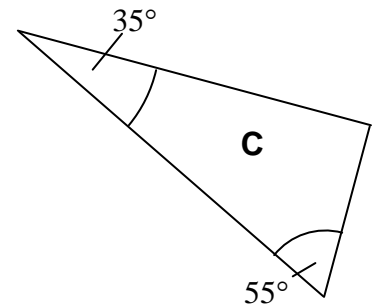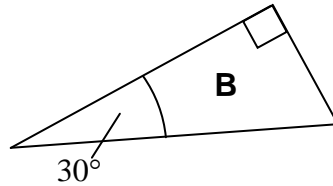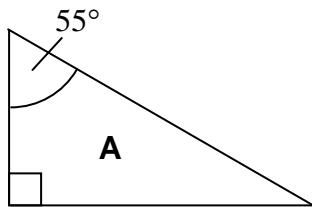
(b)　The sides of a triangle have length 5 cm, 6 cm and 8 cm. The longest side of a **similar** triangle is 12 cm. Work out the **length** of the other two sides of this triangle.

_____ cm

_____ cm

(6 marks)

6   AB is a chord of a circle with centre O. OM is drawn **perpendicular** to AB.
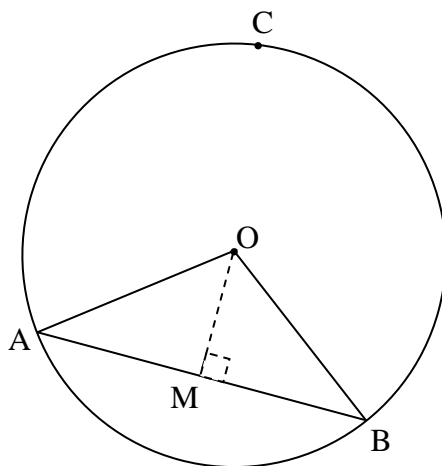
(a)   Prove that M is the **midpoint** of AB.

(b)   C is a point on the circumference of the circle. OA = 6.2 cm and AB = 9.6 cm. Work out the size of ∠AOB and ∠ACB correct to **1 decimal place**.

∠AOB = _____°

∠ACB = _____°

(8 marks)

Name: _____   Class: _____

7   In an electrical circuit, the resistance, R ohms, is **inversely proportional** to the **square** of the current, I amps.

(a)   Write a **formula** that shows the relationship between R and I. (Use k for the constant of proportion.)

$R =$ _____

When the resistance is 4 ohms, the current flowing is 6 amps. Work out:

(b)   the **resistance** when the current is 10 amps

Resistance = _____ ohms

(c)   the **current** when the resistance is 16 ohms

Current = _____ amps

(6 marks)

8   (a) Without drawing the graphs, work out the **coordinates** of the point(s) of
intersection of the parabola $y = x^2 + x - 2$ and the straight line $y = 5x - 6$.

(_____, _____)

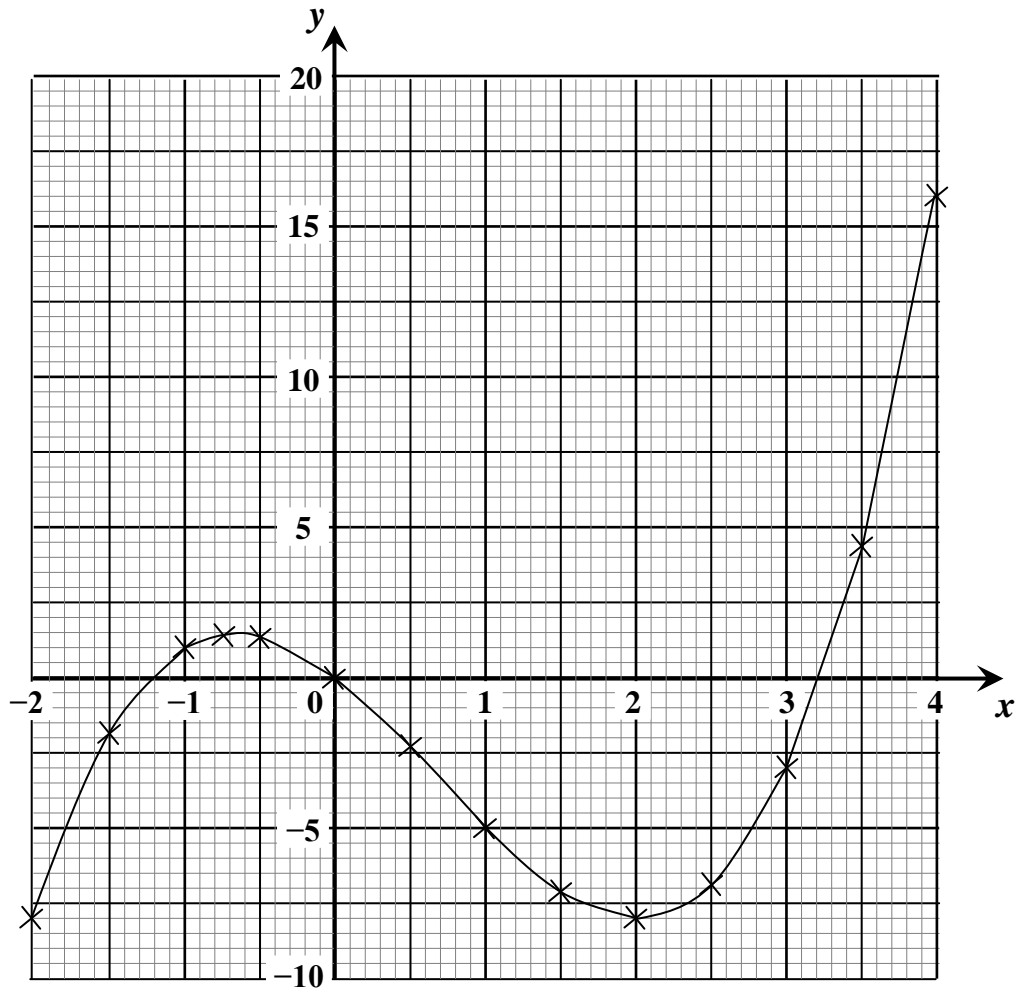(b) Which of the following describes the relationship between the two graphs?
Explain.

_____

_____
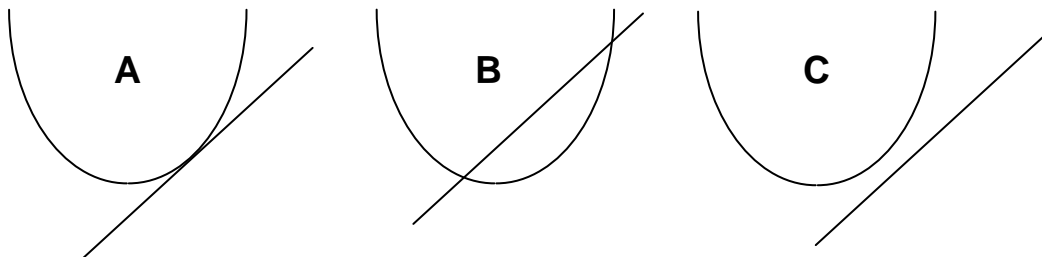
(6 marks)

9   The graph of $y = x^3 - 2x^2 - 4x$ is given below.

(a)   Use this graph to solve the equation

$$x^3 - 2x^2 = 4x$$

$x =$ _____

(b)   By drawing a **straight line** graph solve the equation $x^3 - 2x^2 - 6x + 1 = 0$

$x =$ _____

(6 marks)

10 (a) Write down the value of *n*, given that $\dfrac{32}{\sqrt{2}} = 2^n$

$n =$ _____

(b) Solve the equations.

(i) $5^x = \dfrac{1}{125}$

(ii) $3^{3x+2} = 9^{x+5}$

$x =$ _____

$x =$ _____

(6 marks)

11 (a) Solve: $\dfrac{2x}{3} - \dfrac{3x+2}{4} = \dfrac{7}{12}$

$x =$ _____

(b) Simplify: $\dfrac{2}{x+2} - \dfrac{x-4}{x^2-4}$

(8 marks)

12 The functions f, g and h are defined by

$$f : x \rightarrow 2x + 1 \qquad g : x \rightarrow 3x^2 \qquad h : x \rightarrow \frac{2x+3}{x-1}, \ x \neq 1$$

(a) Find the **value** of $g(-4)$.

$g(-4) =$ _____

(b) **Solve** the equation $f(x) = g(x)$.

$x =$ _____

(c) Find $h^{-1}(x)$.

$h^{-1}(x) =$ _____

(d) **Simplify**: $(x^2 - 2x) \, h^{-1}(x)$.

_____

(8 marks)

13 The **box plot** for the times taken by a group of boys to run 100 metres is shown.
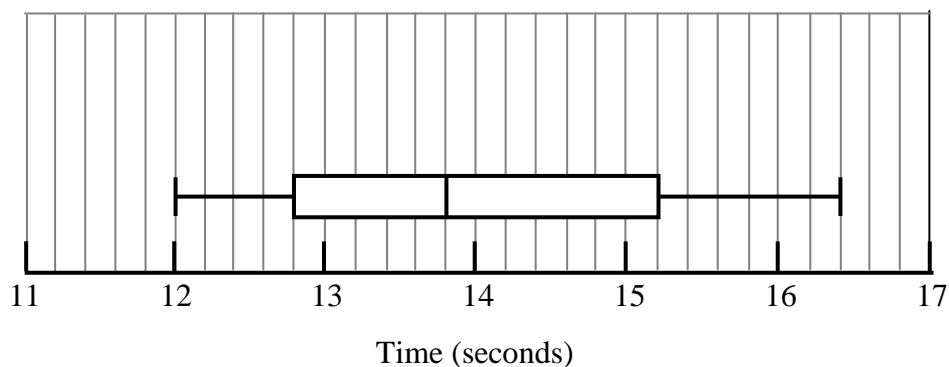
Time (seconds)

(a) Fill in.

fastest time = _____ seconds

median time = _____ seconds

(b) What **percentage** of the boys ran the 100 metres in **less** than 12**.**8 seconds?

_____%

(c) Work out the **interquartile** range.

interquartile range = _____ seconds

After a month training with an athletics coach, the boys obtained the following
(in seconds).

Fastest time	Lower quartile	Median	Upper Quartile	Slowest time
11.4	12.2	13.0	14.8	16.8

(d) **Using the same scale and axes**, draw another box plot to show this data.

(e) Do you think that the training was effective in improving the boys' time? Give
reasons for your answer.

_____

_____

(10 marks)

END OF PAPER