SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009

Directorate for Quality and Standards in Education
Educational Assessment Unit

A

FORM 3 **MATHEMATICS SCHEME A** **TIME: 30 minutes**

Non-Calculator Paper

1	2	3	4	5	6	7	8	9	Total

DO NOT WRITE ABOVE THIS LINE

Name: _____ **Class: _____**

INSTRUCTIONS TO CANDIDATES

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

_____

1. Five, 42-seater coaches are almost full for a sight seeing tour.

   a) Estimate the total number of tourists in them.

   Ans:_____

   b) Each tourist has paid €19.50 for the tour.
   Estimate the total ticket income.

   Ans: _____

_____ (2 marks)

2. a) Make t the subject of the equation $p = 6 + 2t$.

   b) Use your answer to calculate the value of t when $p = 82$.

   Ans: a)_____ b) _____

_____3 marks)

3. Brass is made by mixing copper and zinc in the ratio 7 : 3. What weight of brass can be made with 280g of copper and the required amount of zinc?

   Ans: _____

_____ (3 marks)

4. Express: a) 30 minutes as a fraction of 4 hours. (Give your answer in its lowest form.)
b) 55c as a percentage of €5.

Ans: a)_____ b) _____

_____(2 marks)

5. Work out: a) $\sqrt{25} \times \sqrt{9}$

b) $8^2 + 4^2$

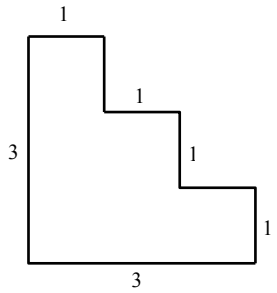
c) $3\frac{1}{2} - 2\frac{1}{4}$

Ans: a)_____ b) _____ c)_____

_____ (3 marks)

6. The figure shows the uniform cross-section of a solid 15 cm long.
(All dimensions are in centimetres.)

a) Calculate the area of its cross-section.



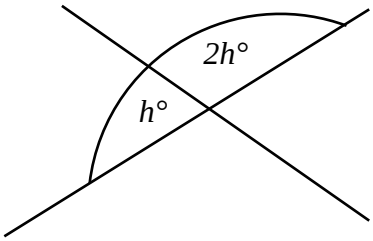
b) Hence or otherwise, calculate its volume.

Ans: a)_____ b) _____

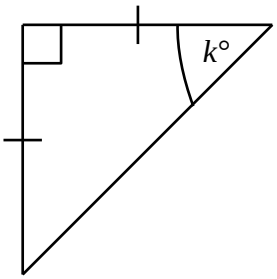
_____ (3 marks)

7. Calculate the values of the letters representing angles in the following diagrams.

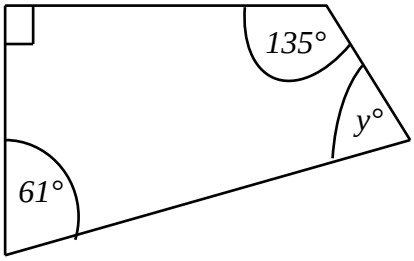
a)



b)



c)



$h =$ _____ $k =$ _____ $y =$ _____

_____ (3 marks)

8. a) Elizabeth buys a computer from shop A.
How much does she save by buying it during the sale?

b) Shop B prices the same computer at €650 and reduces the price by 25% during a sale.
Which is the better deal and by how much?

Ans: a)_____ b) _____

_____ (4 marks)

9. Calculate the simple interest on €800 invested at 4½% per annum for 5 years.

Ans: _____

_____ (2 marks)

END OF PAPER

SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009 **A**

Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 3 **MATHEMATICS SCHEME A** **TIME: 1h 30min**

Main Paper

1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calculator	GLOBAL MARK

DO NOT WRITE ABOVE THIS LINE

Name: _____ **Class:** _____

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

1. Simplify: a) $4a^2 - 2b - 3a^2 - 5b$

Ans: _____

b) $4u^2 \times u$

Ans: _____

c) $x^8 \div x^6$

Ans: _____

d) $(3p)^2$

Ans: _____

_____ (4 marks)

2. a) Factorise: $3x^2 + 6x$. Ans: _____

b) Expand and simplify: $(x - 4)^2$.

Ans: _____

c) Write, in terms of n, an expression for the nth term of the sequence:

4, 8, 12, 16, …….

Ans: _____

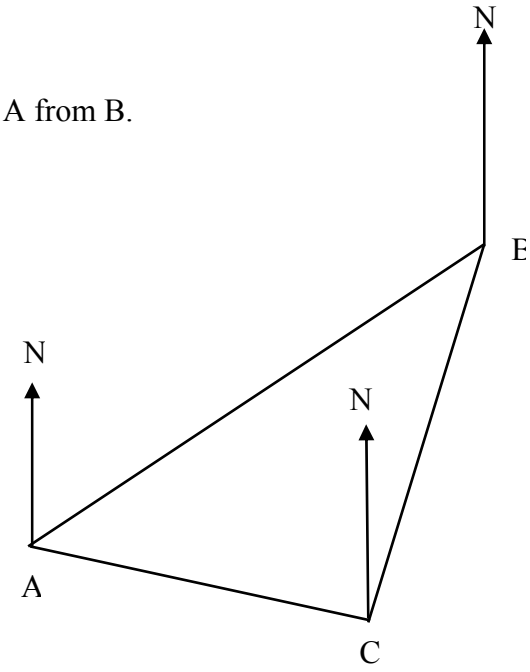
_____ (6 marks)

3. a) The diagram is a scale drawing showing three towns A, B and C.

i) Measure and write down the bearing of A from B.

Ans _____

ii) If the scale used is 1 cm ≡ 15km, what is the actual distance between towns A and C? Give your answer correct to the nearest km.

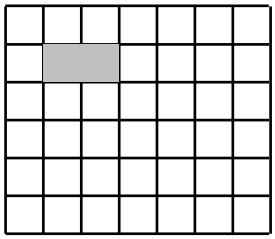


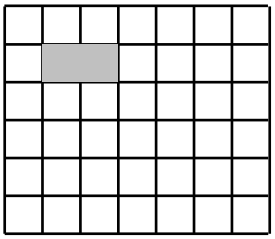
Ans_____

b) (i) " All quadrilaterals tessellate." Is this true or false?

Ans: _____

(ii) On each of the grids below draw a tessellation using rectangles. The two tessellations must be **different**. (Not less than 5 rectangles should be added for each tessellation.) In each case the first rectangle has been drawn for you.

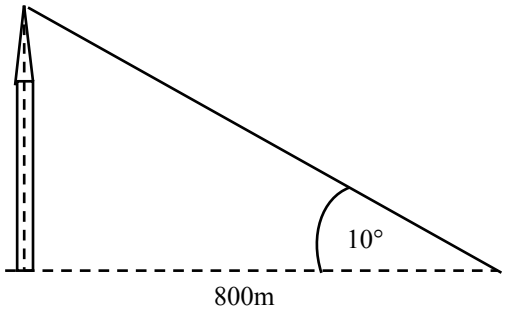




_____ (5 marks)

Name: _____ **Class:** _____ **A**

4. a) The angle of elevation of the top of a vertical tower from a point on level ground 800m away is 10° . Find the height of the tower. Give your answer correct to the nearest metre.



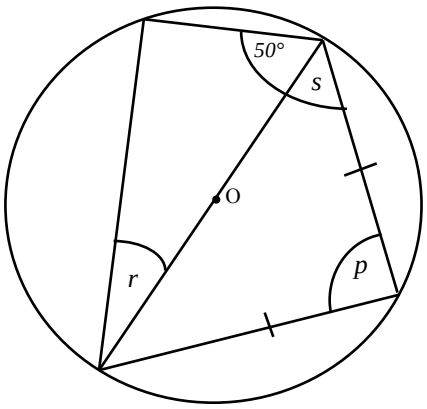
Ans: _____

b) A ship sails 23km due North and then 17km due West. It then sails back to its starting point in a straight line. What is the **total** distance travelled to the nearest km?

Ans: _____

_____(5 marks)

5. Find the angles denoted by the letters in the diagram.
O is the centre of the circle. Give brief reasons for your answers.



Ans: p = _____; Reason: _____

r = _____; Reason: _____

s = _____; Reason: _____

_____ (6 marks)

6. Solve the equations: a) $3(y - 2) = 2y$ b) $\frac{5x}{4} - 2 = 10$

Ans: a) $y =$ _____ ; b) $x =$ _____.

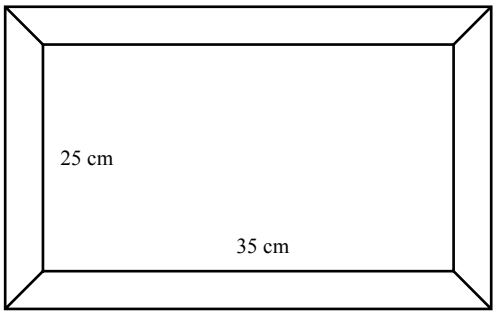
c) Solve the simultaneous equations: $3x + 2y = 16$

$x + y = 7$

Ans: c) $x =$ ____; $y =$ _____

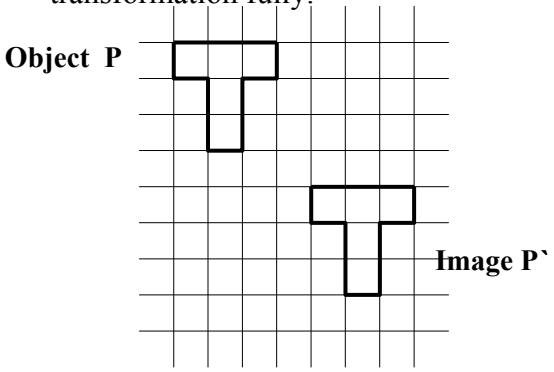
_____ (8 marks)

7.a) Thomas has a photo of a tiger . It measures 14cm wide by 10cm high. He wants to enlarge the photo so that it just fits into this frame. The frame measures 35cm wide by 25cm high. What scale factor should Thomas use to enlarge his photo? (Simplify your answer to its lowest terms.)



Ans: _____

b) On the grid below, shape P has been transformed into its image P`. Describe this transformation fully.



_____

_____

_____

_____

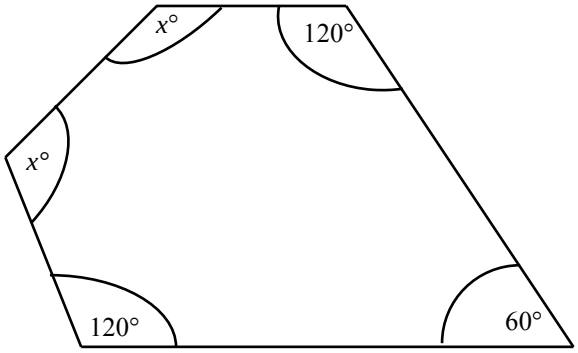
_____ (4 marks)

8. a) What is the name of a 6-sided polygon? Ans _____

b) What is the sum of the exterior angles of a polygon? Ans_____

c) Complete the following statement: 'In a _____ polygon all sides and all _____ are equal.'

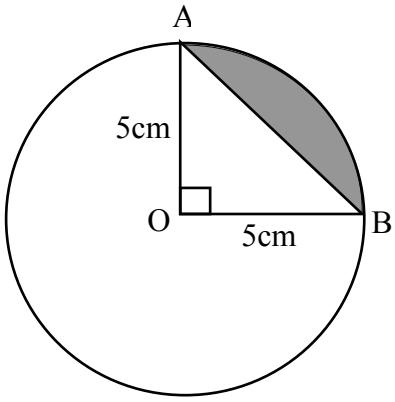
d) Work out the value of *x* in the polygon below.



Ans _____

_____ (6 marks)

9. The figure shows a circle centre O and radius 5cm.
Angle AOB is a right angle.
Giving **all** your answers correct to 2 decimal places, calculate the area of:



a) the sector OAB of the circle.

Ans: _____

b) the triangle OAB.

Ans: _____

c) the shaded area .

Ans: _____

_____ (6 marks)

10. a) Complete the table for values of $y = x^2 + 4$.

x	-3	-2	-1	0	1	2	3
x^2		4	1	0	1		9
4	4	4	4	4			
y		8	5	4	5	8	

b) On the graph paper provided, plot the values of x and y from your table. Use a scale of 2cm for 1 unit on both axes.

c) Join the points with a smooth curve.

d) State the minimum value of y on the curve and the corresponding value of x at this point.

Ans $x =$ _____; $y =$ _____

e) Use your graph to solve the equation $x^2 + 4 = 12$. Give your answers correct to 2 significant figures.

. Ans $x =$ _____; _____

_____(7 marks)

11. The table shows the membership of a youth club.

	Under 16	16 and over
Male	18	26
Female	21	25

a) How many members are under 16? Ans _____

b) How many members are females? Ans _____

c) How many members of the club are there altogether? Ans _____

d) A member is chosen at random. What is the probability that the member is:

(i) female? Ans _____

(ii) under 16? Ans _____

(iii) male and 16 or over ? Ans _____

_____ (5 marks)

12. a) State the gradient of the line $y = 5x + 3$. Ans _____

b) What is the y-intercept of the line $3y = x - 6$?

.

Ans _____

c) Calculate the gradient of the line joining the points (5, 4) and (0, 1).

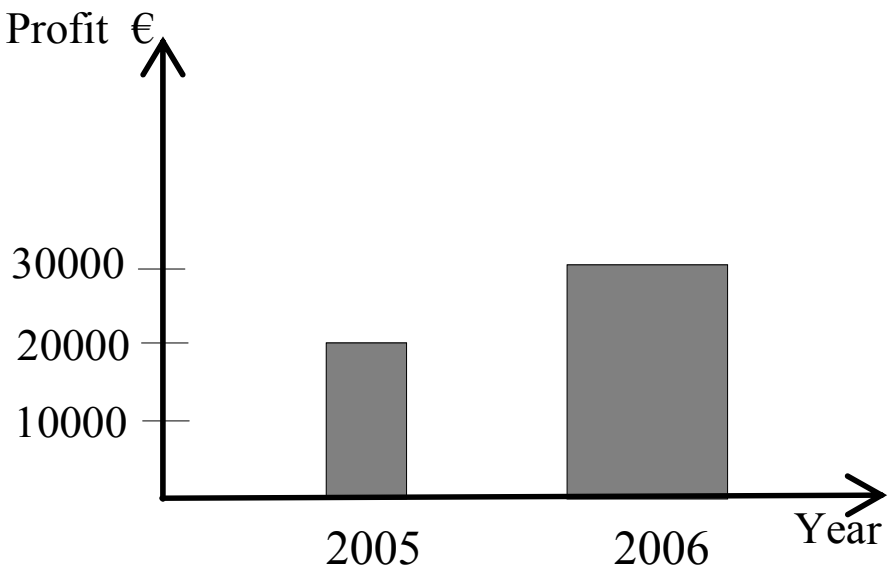
Ans _____

d) Are the lines with equations $y = 4 - x$ and $2y + 2x = 5$ parallel? Why?

Ans _____; _____

_____ (5 marks)

13. a) This chart shows a company's profits in the years 2005 and 2006.
Explain briefly why this chart is misleading.



Ans:_____

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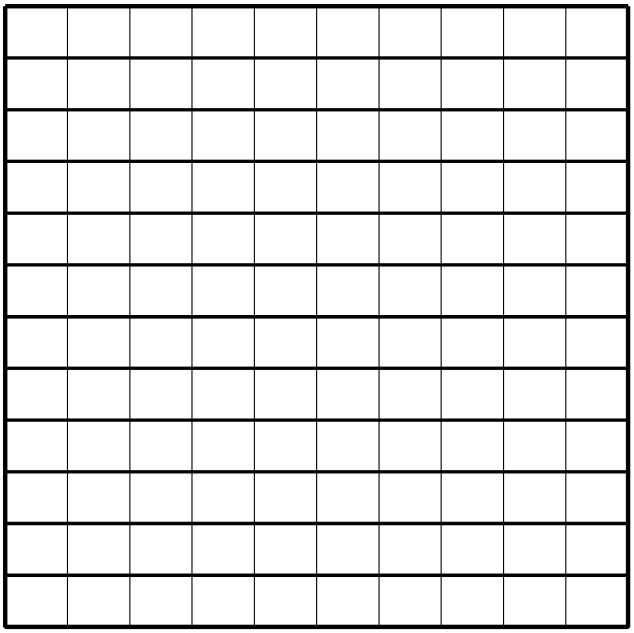
13. b) Claire and Paul measure the height h, in cm of the members of a drama group. The data collected is given below.

165.3	167.4	169.2	170.0	176.1
165.8	168.1	169.5	173.8	178.9
165.9	168.4	169.9	176.0	185.8

i) Complete the following grouped frequency table to show the above data.

Height h (cm)	$165 \leq h < 170$	$170 \leq h < 175$	$175 \leq h < 180$	$180 \leq h < 185$	$185 \leq h < 190$
Frequency					

ii) Use the grid below to draw a histogram to illustrate this data. Label your diagram.



(8 marks)

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