

# SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009

Directorate for Quality and Standards in Education  
Educational Assessment Unit

**FORM 3**

**MATHEMATICS SCHEME A**  
**Non-Calculator Paper**

**TIME: 30 minutes**

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)  $8^2 + 4^2$

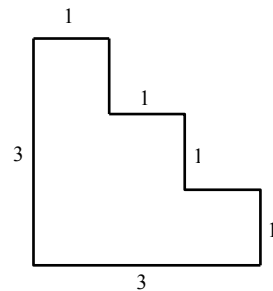
c)  $3\frac{1}{2} - 2\frac{1}{4}$

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.



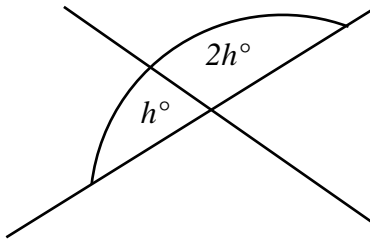
- b) Hence or otherwise, calculate its volume.

Ans: a) \_\_\_\_\_ b) \_\_\_\_\_

(3 marks)

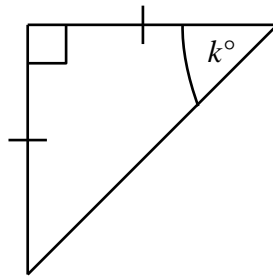
7. Calculate the values of the letters representing angles in the following diagrams.

a)



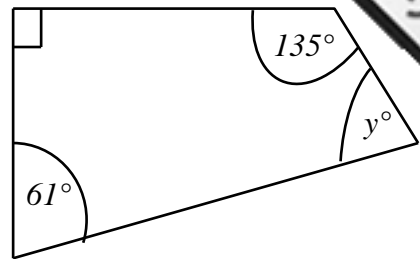
$h =$  \_\_\_\_\_

b)



$k =$  \_\_\_\_\_

c)

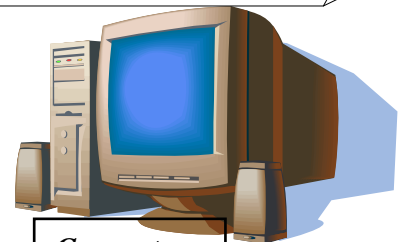


$y =$  \_\_\_\_\_

(3 marks)

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

**SALE  $\frac{1}{3}$  off**  
**all marked prices !**



**Computer:**  
**€699.90**

- 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  $4\frac{1}{2}\%$  per annum for 5 years.

Ans: \_\_\_\_\_

(2 marks)

**END OF PAPER**

# SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009

Directorate for Quality and Standards in Education  
Educational Assessment Unit

FORM 3

MATHEMATICS SCHEME A

TIME: 1h 30m

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  $n$ th term of the sequence:

4, 8, 12, 16, .....

Ans: \_\_\_\_\_

\_\_\_\_\_ (6 marks)

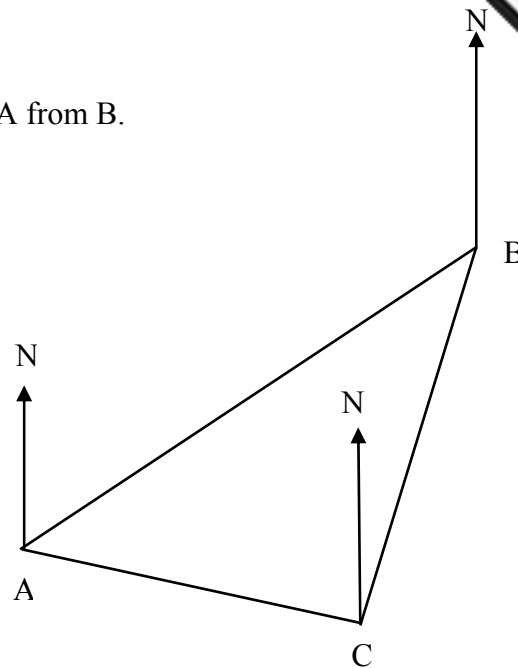
3. a) The diagram is a scale drawing showing three towns A, B and C.

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

Ans \_\_\_\_\_

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

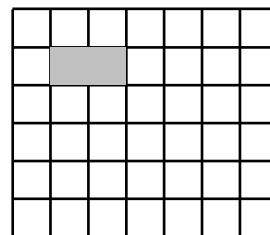
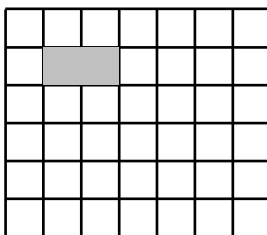
Ans \_\_\_\_\_



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.



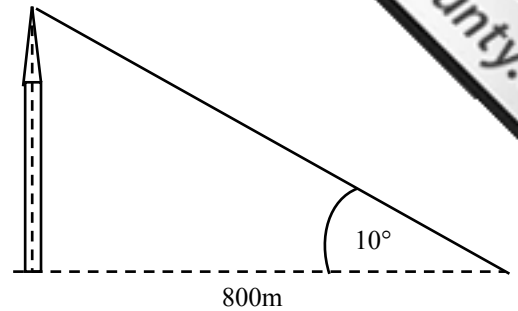
(5 marks)

Name: \_\_\_\_\_

Class: \_\_\_\_\_



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



Ans: \_\_\_\_\_

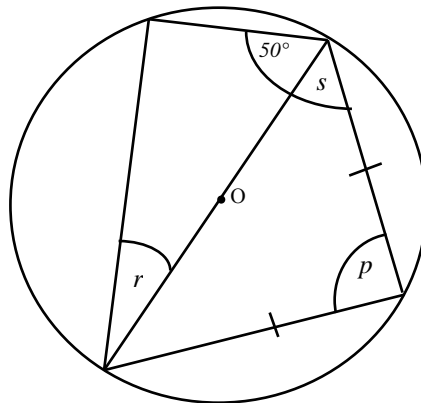
- b) A ship sails 23km due North and then 17km due West. It then sails back to its starting point in a straight line. What is the **total** distance travelled to the nearest km?

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)  $y = \underline{\hspace{2cm}}$  ;

b)  $x = \underline{\hspace{2cm}}$  .

c) Solve the simultaneous equations:

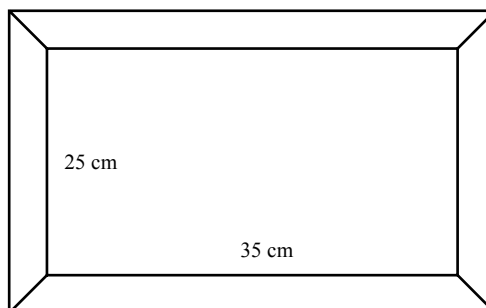
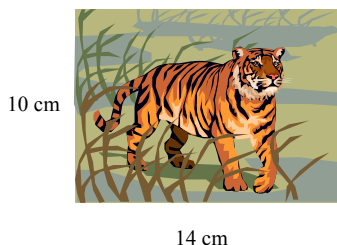
$$3x + 2y = 16$$

$$x + y = 7$$

Ans: c)  $x = \underline{\hspace{2cm}}$  ;  $y = \underline{\hspace{2cm}}$

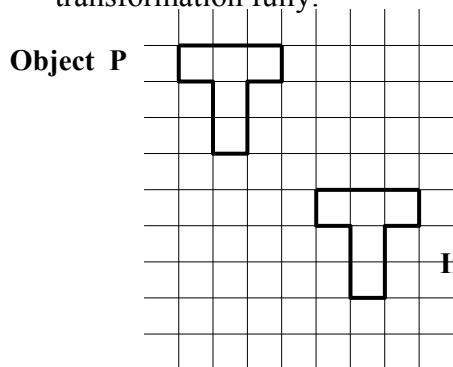
(8 marks)

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:  $\underline{\hspace{2cm}}$

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




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(4 marks)



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

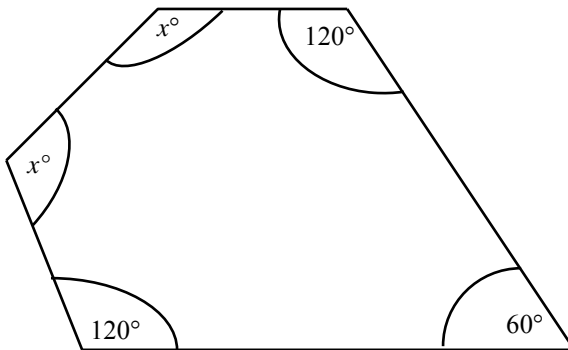
Ans \_\_\_\_\_

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.

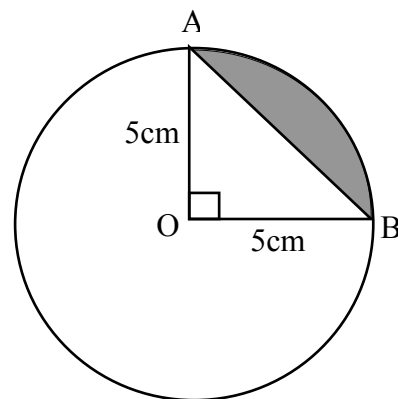


Ans \_\_\_\_\_

(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).

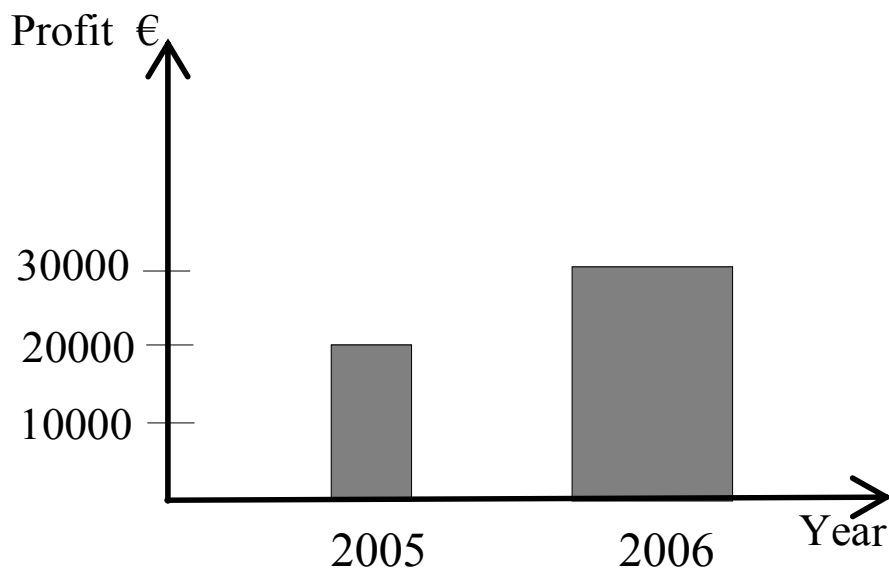
Ans \_\_\_\_\_

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: \_\_\_\_\_

**PLEASE TURN OVER**

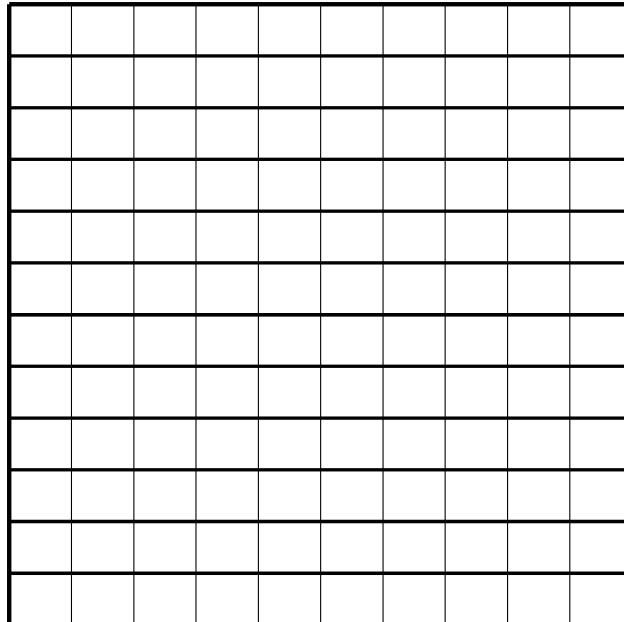
13. b) Claire and Paul measure the height  $h$ , in cm of the members of a drama group. The collected is given below.

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)

**END OF PAPER**