SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009
Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 5   **MATHEMATICS SCHEME B**   **TIME: 20 minutes**
Non Calculator Paper

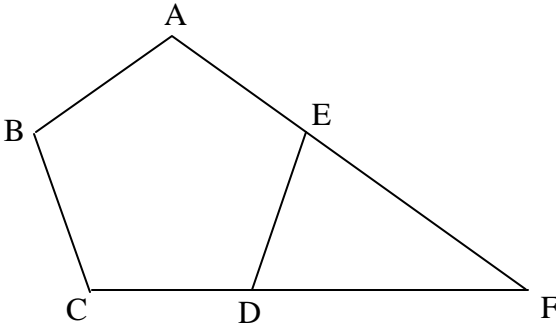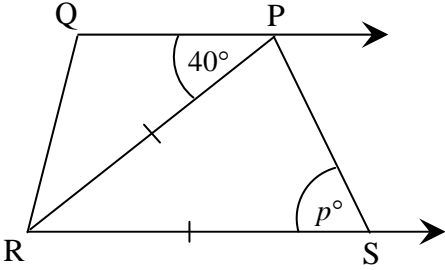**Name:** _____   **Class:** _____

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	5% of a sum of money is €10. What is the sum of money? **Answer**: €_____	
2	Write 0**.**35 as a **fraction** in its **lowest terms**. **Answer**: _____	
3	Work out the **circumference** of a circle with a radius of 14 cm. (Take $\pi = \dfrac{22}{7}$) **Answer**: _____cm	
4	Michela changed €5 into 20 cent coins. How many coins did she get? **Answer**: _____	
5	Given that $\mathbf{4^x = 8^2}$, write down the value of $\boldsymbol{x}$. **Answer**: $x =$ _____	
6	The equation of a straight line is $y = 3x - 5$. The line passes through the point $(a$, $-8)$. Write down the value of a. **Answer**: $a =$ _____	
7	Work out the **difference** between 20% of €73 and 20% of €23. **Answer**: €_____	
8	Given that $567 \times 23 = 13041$, write down the value of 130**.**$41 \div 2$**.**3. **Answer**: _____	

No.	Question	Space for Working
9	The **mean** of five numbers is 7. Four of the numbers are 5, 7, 8 and 11. What is the other number? **Answer**: _____	
10	ABCDE is a **regular** pentagon. AE and CD are produced to meet at F. Work out the size of ∠DFE. **Answer**: _____	
11	A car was bought in 2000 for €10 000. It was sold in 2005 for €6 000. Work out the **percentage decrease** in the price of the car. **Answer**: _____%	
12	Work out: $1-\dfrac{8}{9}\times\dfrac{3}{4}$ **Answer**: _____	
13	Write down the **smallest prime number** that is greater than 2π. **Answer**: _____	
14	A car travels a distance of 24 km in 15 minutes. Work out the **average speed** in km/h. **Answer**: _____km/h	

No.	Question	Space for Working
15	Write $\sqrt{\dfrac{9}{16}}$ as a **decimal**. **Answer**: _____	
16	The scale of a map is 1 **:** 50 000. On the map the distance between two towns is 10 cm. Work out the actual distance in **kilometres**. **Answer**: _____km	
17	In a bag there are 3 red, 5 blue and some green marbles. One marble is selected at random from the bag. The probability of selecting a red marble is one-fifth. How many **green marbles** are there in the bag? **Answer**: _____	
18	Given that $y = 2x^2 - 1$, write down the value of y when $x = -2$. **Answer**: _____	
19	Work out the value of p. **Answer**: _____	
20	€120 is shared in the ratio 3 **:** 7. Work out the size of the **smaller** share. **Answer**: €_____	

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FORM 5   **MATHEMATICS SCHEME B**   **TIME: 1h 40min**
Main Paper

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

Name: _____   **Class:** _____

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

1   Mario is using a spreadsheet to find the **area** and **perimeter** of a **rectangle**.

	A	B	C	D
	Length	**Width**	**Area**	**Perimeter**
1				
2	12	7.5	90	39
		7	84	38

(i)   What **formula** did Mario write in cell **D2**? =_____

(ii)   What **number** did he write in cell **A3**? _____

<div align="right">(2 marks)</div>

2   **Factorise** completely.

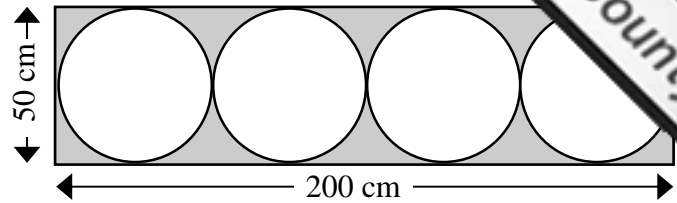(i) $9a - 6 =$ _____   (ii) $3a^2 - 2a =$ _____

Hence **simplify**: $\dfrac{3a^2 - 2a}{9a - 6} - \dfrac{a}{6}$

Answer: _____

<div align="right">(4 marks)</div>

3 Four circular pieces of metal are cut from a rectangular sheet of metal measuring 200 cm by 50 cm.

50 cm

200 cm

Work out, correct to **1 decimal place**:
(i) the **area** of one of the circles,

Area = _____ cm^2

(ii) the **area** of **metal wasted**.

Area = _____ cm^2

(4 marks)

4 The distance, *s*, moved by a body is given by the formula:

$$s = ut + \frac{1}{2}at^2$$

where *u* is the initial velocity, *a* is the acceleration and *t* is the time taken.
(i) Work out the value of *s* when $u = 12$, $a = -9.8$ and $t = 2$.
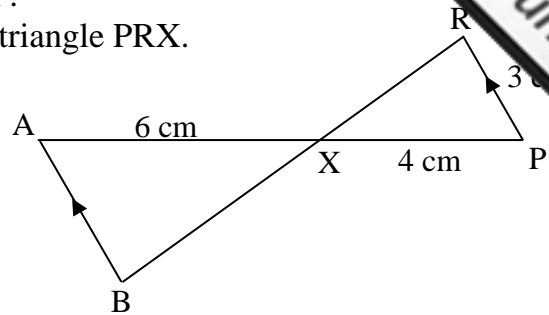
s = _____

(ii) Make *a* the **subject of the formula**.

a = _____

Name: _____   Class: _____

5 AP and BR intersect at X. AB is parallel to RP.

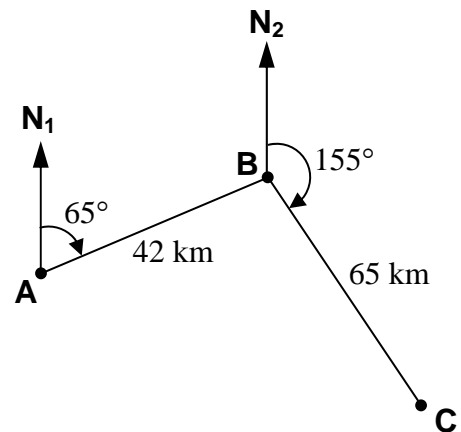   (i)   Explain why triangle ABX is **similar** to triangle PRX.

   (ii)   AX = 6 cm, PX = 4 cm and PR = 3 cm. Work out the **length** of **AB**.

AB = _____ cm

(5 marks)

6 An aircraft flies 42 km from an airfield, A, on a bearing of 065° to B. Then it changes course and flies 65 km on a bearing of 155° to C.

   (i)   Show that ∠ABC = 90°.

   (ii)   Work out
      (a)   the **distance** of C from A, correct to the **nearest kilometre**

Distance = _____ km
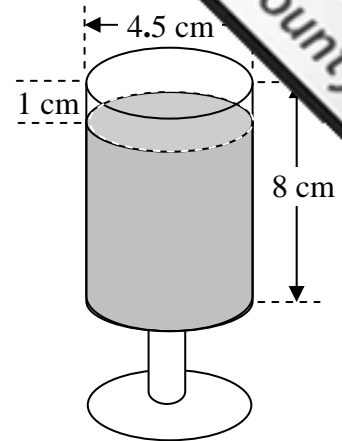
      (b)   the **bearing** of C from A, correct to the **nearest degree**.

Bearing = _____

(7 marks)

7   A cylindrical glass has a **diameter** of 4**.**5 cm and is 8 cm high.
The glass is filled with wine up to 1 cm from the brim.

   (i)   Work out the **volume** of wine in the glass, correct to **1 decimal place**. (Volume $= \pi r^2 h$)

← 4.5 cm

1 cm

8 cm

Volume = _____ cm^3

   (ii)   A bottle of wine can hold 0**.**75 litres of wine. A number of similar glasses are all filled from the bottle up to 1 cm from the brim. Work out the **number of glasses** that can be filled in this way. (1 litre $= 1000$ cm^3)

_____ glasses

(6 marks)

8   During a year a man travelled 9 600 km in his car.

   (i)   The car travels 12 km with a litre of petrol. Work out the amount of petrol used during the year.

_____ litres

   (ii)   Petrol costs €1**.**20 per litre. How much did the man spend on petrol?

€_____

   (iii)   Other expenses for running the car amounted to €2880. Work out the cost **per kilometre** for running the car.

€_____

(6 marks)

9   (i)   Complete the table for $y = 2x + 4$.

↑ *y*

x	–2	–1	0
$y = 2x + 4$		2	

(ii) **Use the table** to draw the graph of $y = 2x + 4$.

(iii) Complete the table for $y = 1 - x$.

x	–2	0	2
$y = 1 - x$	3		

(iv) **Use the table** to draw the graph of $y = 1 - x$.

(v) **Use the two graphs** to solve the equations: $\begin{aligned} 2x - y &= -4 \\ x + y &= 1 \end{aligned}$

$x = $ _____, $y = $ _____

(8 marks)

10 As part of a biology project, Anna and Rita counted the number of peas in a sample of pea pods. These are their results for the first 50 pods.

| Number of peas in a pod	3	4	5	6	7	8	9
Number of pods	2	7	14	11	9	5	2

(i) Fill in: **Mode** = _____

(ii) Out of 200 pods, how many would you expect to have 5 peas? _____

(iii) Anna takes a pod at random from the sample.
What is the **probability** that the pod contains **more** than 6 peas? _____

(iv) Work out the **mean** number of peas in a pod.

Mean = _____

(8 marks)

11 BD is the **diameter** to a circle with centre O.
PDQ is a **tangent** to the circle.
∠ADQ = 28° and ∠CAD = 76°.
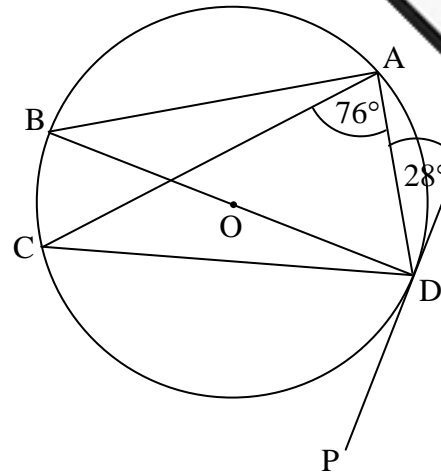
(a) Write down the size of the following angles, **giving reasons for your answers**.

(i) ∠BAD

∠BAD = _____ reason: _____

(ii) ∠BDA

∠BDA = _____ reason: _____

(iii) ∠ABD

∠ABD = _____ reason: _____

(b) **Explain** why triangle ACD is **isosceles**.

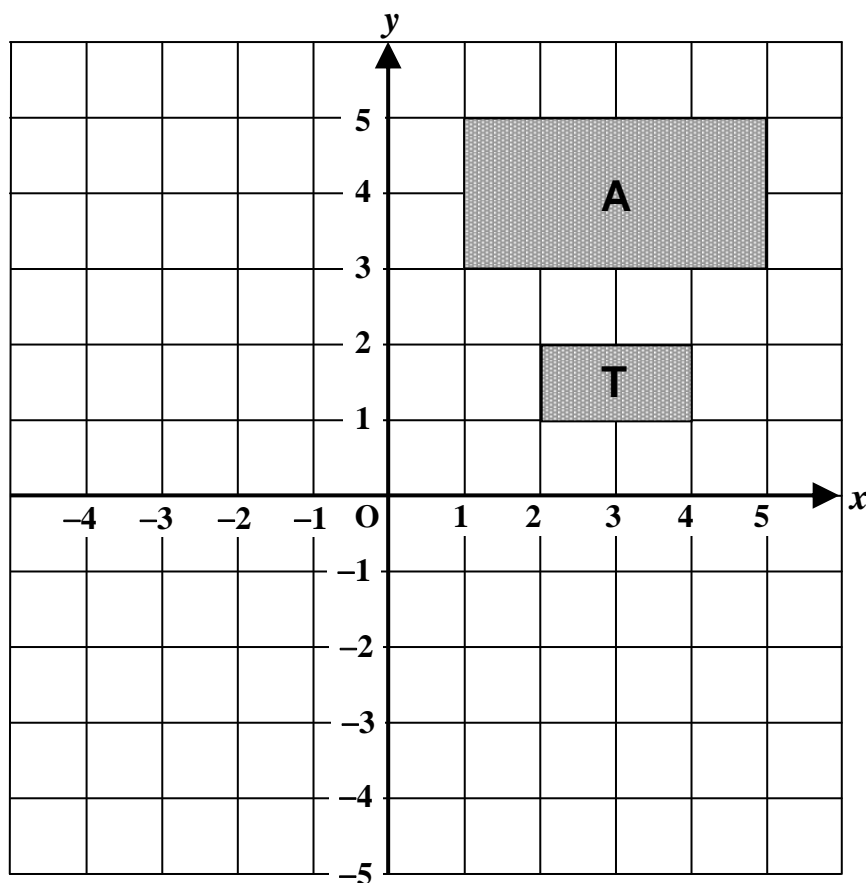_____

_____

_____

_____

(8 marks)

12 (a) Write the **single transformation** that maps rectangle **T** onto rectangle **A**.

_____

_____

(b) Rectangle **T** is reflected in the *y*-axis to give rectangle **B**. Draw and label rectangle **B**.

(c) Rectangle **T** is rotated clockwise through an angle of 90° about (0, 0) to give rectangle **C**. Draw and label rectangle **C**.

(d) Rectangle **T** is **translated** using the vector $\begin{pmatrix} -6 \\ -4 \end{pmatrix}$ to give rectangle **D**. Draw and label rectangle **D**.

(8 marks)

13 (i)   Complete the table below for $y = x^2 - 3x - 5$.

x	−2	−1	0	1	2	3	4	5
x^2	4		0	1			16	25
$-3x$	6		0	−3			−12	−15
−5	−5	−5	−5	−5	−5	−5	−5	−5
y	5		−5	−7			−1	5

.

(ii)   **Use this table** to draw the graph of $y = x^2 - 3x - 5$ for values of x from −2 to 5. Take 2 cm as 1 unit on both axes.

(iii) **Use your graph** to find an **estimate** for
   (a)   the **two** values of x for which $y = -2$.

      $x =$ _____, _____

   (b)   the **minimum** value of y and the corresponding value of x.

      minimum value of $y =$ _____, $x =$ _____

(10 marks)

END OF PAPER