DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department for Curriculum Management and eLearning
Educational Assessment Unit
Annual Examinations for Secondary Schools 2011

FORM 3 **MATHEMATICS** **TIME: 30 minutes**
(Non-Calculator Paper)

Name: _____ **Class: _____**

1	2	3	4	5	6	7	8	9	Total

INSTRUCTIONS TO CANDIDATES

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

1. a) **Simplify**: i) $2x + 5 + 7(x - 1)$ ii) $\frac{x+y}{5x+5y}$

Ans (i) _____ Ans (ii) _____

b) Find the **value** of $3x(y + z)$, when $x = 7$, $y = -1$, $z = -2$.

Ans: _____

_____(3 marks)

2. a) Simplify this ratio: 12 : 72 : 144

Ans: _____

b) Work out the average speed of a plane that flies 210 km in 90 minutes.

Ans: _____

_____(2 marks)

3. Work out the following:

a) 2^4 = _____ b) $\left(\frac{1}{2}\right)^0$ = _____ c) 3^{-2} = _____

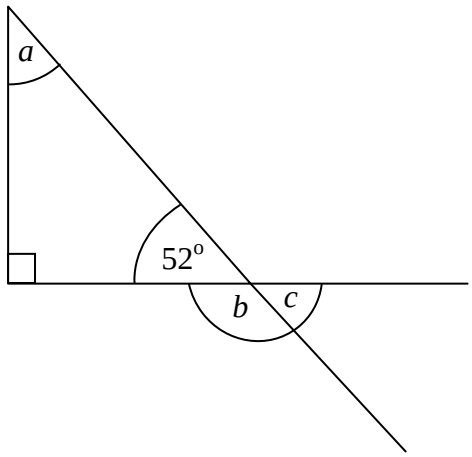
_____(3 marks)

4. At a sale prices are reduced by 15%. Work out the sale price of a glass table marked €160.

Ans: _____

_____(2 marks)

5. Calculate the size of each **angle** marked by a letter.



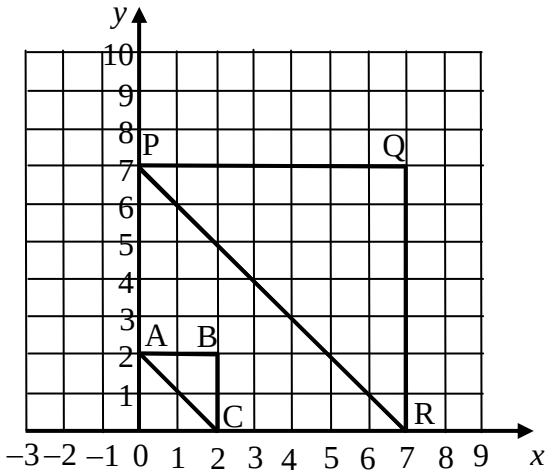
a = _____

b = _____

c = _____

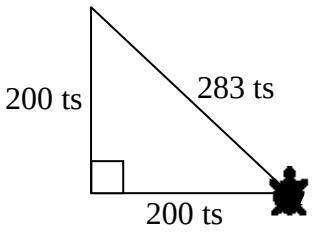
_____(3 marks)

6. a) Fill in: ΔABC is **enlarged** to ΔPQR by **scale factor** _____.



b) Complete the LOGO program which draws the figure on the right.

PD
LT _____
FD 283
LT 135
FD 200
LT 90
FD 200



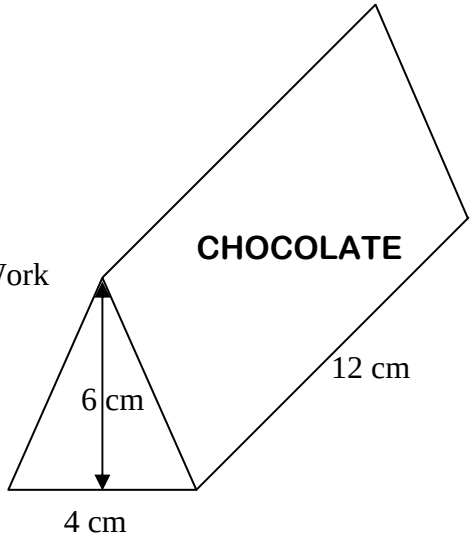
_____(2 marks)

7. Work out $4\frac{1}{5} - 1\frac{1}{2} + 3\frac{1}{10}$ giving your answer as a mixed number in its lowest

Ans: _____

_____(3 marks)

8. The picture shows a bar of chocolate.



a) Work out the **area** of the cross-section.

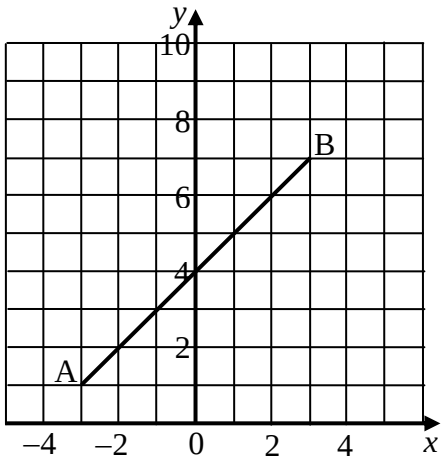
Area = _____cm^2

b) 1 cm^3 of chocolate is equivalent to 3 calories. Work out the total number of calories in this bar of chocolate.

_____ calories

_____(3 marks)

9.



a) Write down the ***y* intercept** of the line AB.

y intercept = _____

b) Work out the **gradient** of line AB.

gradient = _____

c) Write down the equation of line AB.

Equation is _____

_____(4 marks)

END OF PAPER

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

Name: _____ **Class:** _____

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

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

1. a) Write 5468000 in **standard form**. Ans: _____

b) i) Factorise completely: $9ab + 6b^2$ Ans: _____

ii) Expand and simplify: $(2a + 1)(a - 3)$ Ans: _____

_____(4 marks)

2. a) Write the next two terms of this sequence: 3 , 7 , 11 , 15 , ____ , ____ .

b) i) Find the $\boldsymbol{n}^{th}$ term of the above sequence.

Ans: _____

ii) Write the 50^{th} term of the sequence.

Ans: _____

_____(4 marks)

3. Rebecca throws two ordinary dice, one yellow and the other blue. She **adds** the scores shown on the dice.

a) Complete the table to show all the possible outcomes.

		Dice 1 (Yellow)					
Dice 2 (Blue)		**1**	**2**	**3**	**4**	**5**	**6**
	1	2	3				
	2	3	4				
	3						
	4						
	5						
	6						

b) Use your table to find

i) P (8) = _____

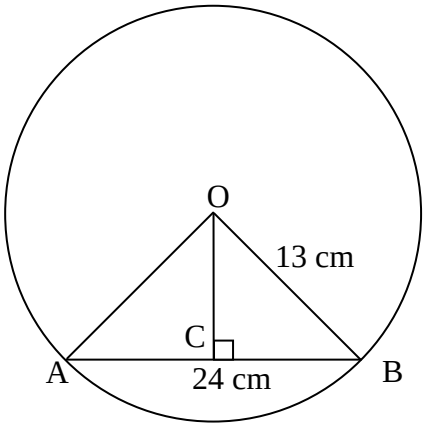
ii) P (more than 10) = _____

iii) P (square number) = _____

Give your answers in their simplest form.

_____(5 marks)

4. O is the centre of a circle of radius 13 cm. AB is a chord 24 cm long and OC is perpendicular to the chord AB.



a) Find the length of OC.

OC = _____cm

b) Calculate angle COB giving your answer correct to **1 decimal place**.

∠COB = _____°

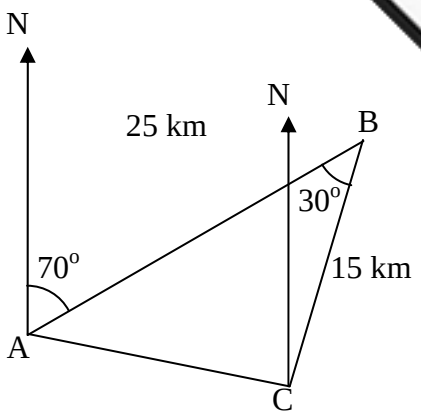
c) Find the length of the **minor arc AB.** Give your answer correct to **3 significant figures**.

AB = _____cm

_____(8 marks)

Name_____ Class_____ **A**

5. This sketch shows the positions of three schools A, B and C.



a) Make an accurate drawing of the sketch using a scale of 1 cm to 5 km.

(b) Use your **protractor** to find the **bearing** of A from C.

Bearing of A from C = _____

_____(4 marks)

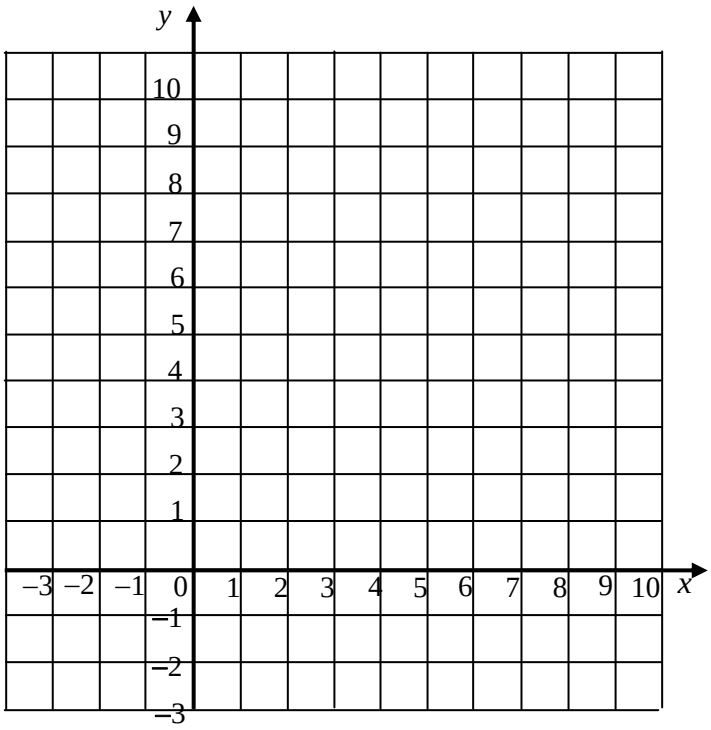
6. **Solve** the simultaneous equations: $4x - y = 10$, $3x + 2y = 13$

_____(4 marks)

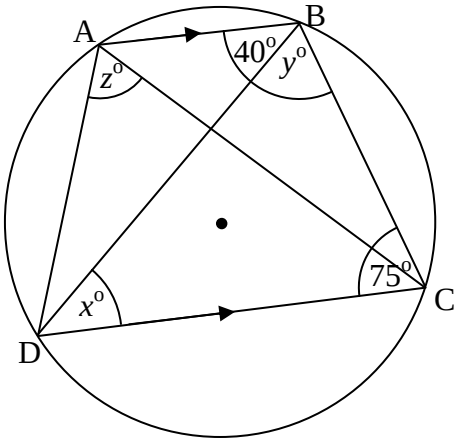
7. a) i) Draw a triangle with vertices (1, 4), (1, 6) and (2, 6). Label it **A**.

ii) Draw the line $y = x$. Reflect triangle A in the line $y = x$. Label it **B**.

iii) Rotate triangle B through 90^o anticlockwise, about the point (5, 5). Label it **C**.



b) ABCD is a quadrilateral with AB parallel to DC.
Work out, giving reasons, the values of the angles marked *x*, *y* and *z*.



x = _____ ^{o}

Reason: _____

y = _____ ^{o}

Reason: _____

z = _____ ^{o}

Reason: _____

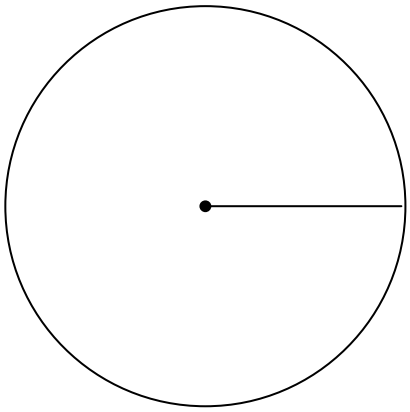
_____(8 marks)

8. 90 people take part in a survey on how they prefer to spend their leisure time. These results are to be illustrated in a pie chart.

a) Complete the table by working out the angle of each slice of the pie chart.

Leisure Time	No. of People	Angle
Watching Live Sport	5	
Playing sport	23	
Watching TV	45	
Internet	7	
Going Out	10	

b) **Draw** and **label** the pie chart.



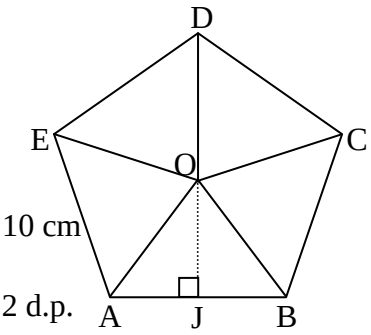
_____(5 marks)

9. ABCDE is a regular pentagon of side 10 cm and O is the centre of the pentagon.

a) Fill in: ∠AOB = _____, ∠OAB =_____.

b) Work out the size of ∠CDE.

∠CDE = _____°



c) Work out the length of **OJ** giving your answer correct to 2 d.p.

OJ = _____cm

d) Calculate the **area** of triangle AOB. Give your answer correct to 3 significant figures.

Area = _____cm^2

_____(8 marks)

10. Luke is saving money from his part-time work. The amounts he saves each month are shown in the spreadsheet.

	A	B
1	**Month**	**Amount €**
2	January	142.80
3	February	153.50
4	March	149.20
5	April	151.30
6	May	143.00
7	June	145.80
8	**Average**	

a) What **formula** should be written in cell B8 to find the average?

Ans: =_____

b) Work out his **average** of savings per month.

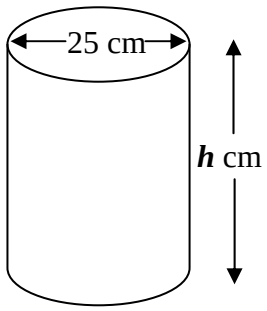
Ans: €_____

c) Luke puts all his savings in a bank. Interest is at 4% p.a. How much **simple interest** correct to the nearest cent, will he receive after 2 years?

Ans: €_____

_____(6 marks)

11. a) A hollow cylinder has a diameter of 25 cm. Work out the height, ***h***, if its curved surface area is 900π cm^2.



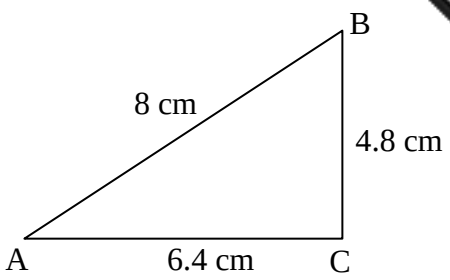
h = _____cm

b) Solve: $\frac{x-5}{4} = \frac{3x-1}{10}$

x = _____

_____(7 marks)

12. a) Show that ∠ACB is a right angle.



b) Work out the **angle of elevation** of B from A, giving your answer correct to the nearest degree.

Ans: _____

_____(5 marks)

13. a) Complete the table for values of $y = x^2 - 2x - 3$.

x	–2	–1	0	1	2	3	4
x^2	4		0	1	4		
$-2x$	4		0	–2	–4		
–3	–3		–3	–3	–3		
y	5		–3	–4	–3		

b) Use a scale of 2 cm = 1 unit on both axes to draw the graph $y = x^2 - 2x - 3$.

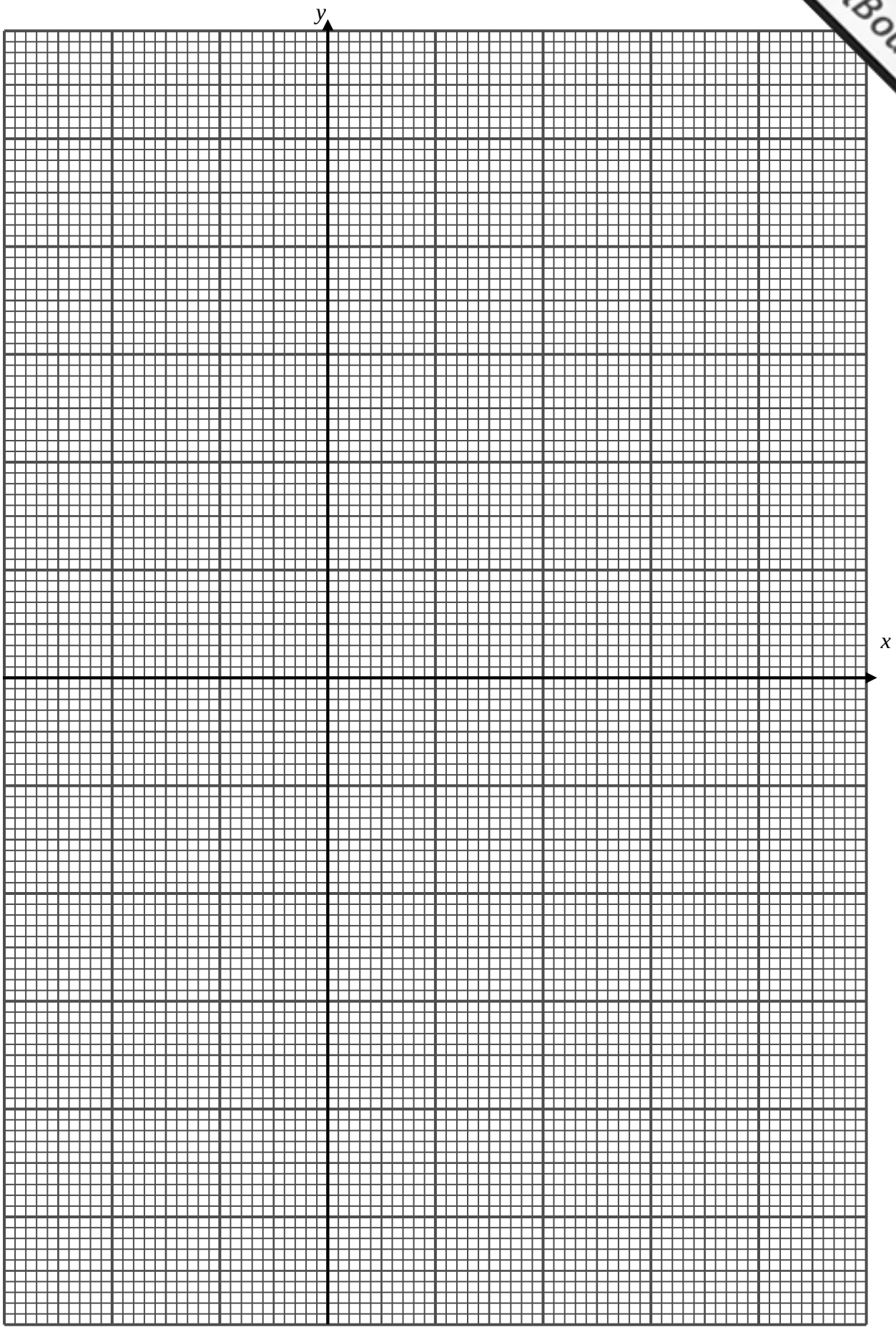
c) Write the minimum value of ***y*** and the corresponding value of ***x***.

y = _____, ***x*** = _____

d) Use your graph to solve $x^2 - 2x - 3 = 0$.

x = _____ , _____

_____(7marks)



End of Paper