

**Annual Examinations for Secondary Schools 2015**

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**FORM 5**

**MATHEMATICS TRACK 2**  
**Non Calculator Paper**

**TIME: 20 minutes**

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

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

**Mark**

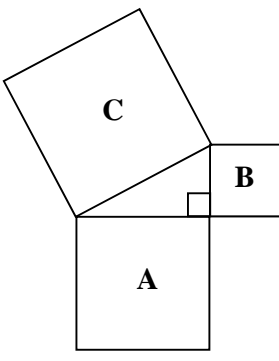
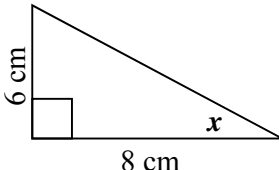
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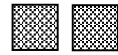
**INSTRUCTIONS TO CANDIDATES**

- **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	Work out $38 \times 1000$ giving your answer in <b>standard form</b> .  _____	
2	Find the cost of 48 books at €9.99 each.  € _____	
3	Given that $f(x) = 3x^2$ , write down the value of $f(-2)$ .  _____	
4	The <b>area</b> of a rectangular room is $28 \text{ m}^2$ . What <b>length</b> and <b>width</b> can the room have?  Length = _____ m  Width = _____ m	
5	Work out the <b>simple interest</b> on €5000 at 4% per annum for 2 years.  Interest = € _____	
6	<b>Underline</b> the value of $(-1)^{43}$ . A. -1    B. 1    C. -43    D. 43	
7	5% of a sum of money is €150. What is 40% of the sum of money?  € _____	
8	If $654 \times 321 = 209\,934$ , write down the value of $20.9\,934 \div 3.21$ .  _____	
9	The circumference of a circle is 54 cm. <b>Underline</b> the <b>best estimate</b> for the <b>radius</b> of the circle. A. 18 cm    B. 9 cm    C. 6 cm    D. 3 cm	

No.	Question	Space for Working
10	Work out. $\sqrt[3]{\frac{8}{27}}$ _____	
11	Write the <b>next term</b> in the sequence: 27, 9, 3, 1, ...  _____	
12	Evaluate. $10^4 \times 0.01$ _____	
13	Given that $a = \sqrt{b^2 - c^2}$ , find the value of $a$ when $b = -5$ and $c = 4$ .  $a =$ _____	
14	11 trees are planted at equal intervals in a straight line. The distance from the first tree to the third tree is 10 metres. What is the distance from the first to the last?  _____ metres	
15	Write down the <b>cube</b> of $-3$ .  _____	
16	Work out, giving your answer in its <b>lowest terms</b> . $\frac{3}{4} - \frac{9}{20}$ _____	
17	The scale of a map is <b>1 : 50 000</b> . On the map the distance between two towns is 10 cm. Work out the <b>actual distance</b> between the two towns <b>in km</b> .  _____ km	

No.	Question	Space for Working
18	Work out. $999 \times 14 - 999 \times 4$ _____	
19	<p>Three squares are drawn on the sides of a right-angled triangle. The area of square C is <math>289 \text{ cm}^2</math> and the area of square A is <math>225 \text{ cm}^2</math>. Work out the <b>length</b> of one side of square B.</p>  _____ cm	
20	<p>Write down the value of <math>\cos x</math>.</p> <p>Give your answer as a <b>fraction</b>.</p>  _____	



Annual Examinations for Secondary Schools 2015

FORM 5

MATHEMATICS TRACK 2

TIME: 1h 40min

Main paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calc	Global Mark
Mark																

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

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

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

1 (a) Factorise:  $2p^2 - pq$ .

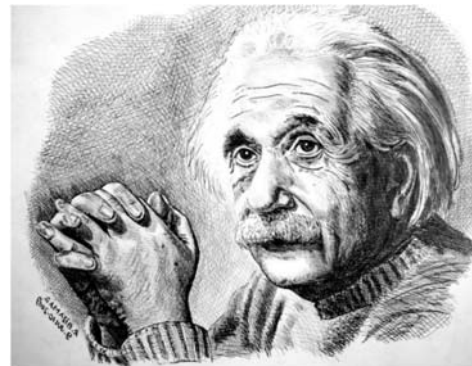
\_\_\_\_\_

(b) Hence simplify:  $\frac{2p^2 - pq}{pq}$

\_\_\_\_\_

2 marks

2 Einstein's famous formula states that  $E = mc^2$ .  
Work out the value of  $E$  given that  $m = 1.5 \times 10^{-3}$   
and  $c = 2.5 \times 10^7$ . Give your answer in **standard  
form**.



Albert Einstein (1879-1955)

$E =$  \_\_\_\_\_

3 marks

3 When a dealer sells a tablet for €560, she makes a profit of 12%.

(a) Work out the **profit**, in euro.



Profit = € \_\_\_\_\_

(b) The dealer wants to make a profit of 15%. How much should she sell the tablet for?

Selling price = € \_\_\_\_\_

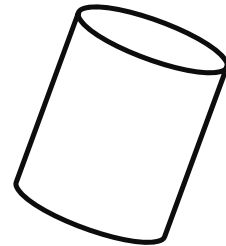
5 marks

4 To find the **volume** of a cylinder *multiply  $\pi$  by the square of the radius and by its height.*

(a) Let  $V$  represent the volume,  $r$  the radius and  $h$  the height of the cylinder. Write a **formula** for  $V$  in terms of  $\pi$ ,  $r$  and  $h$ .

$V =$  \_\_\_\_\_

(b) Work out the **volume** of the cylinder given that its diameter is 11 cm and its height is 18 cm. Give your answer correct to **two decimal places**.



Volume = \_\_\_\_\_  $\text{cm}^3$

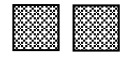
(c) Make  $r$  the **subject** of the formula.

$r =$  \_\_\_\_\_

6 marks

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

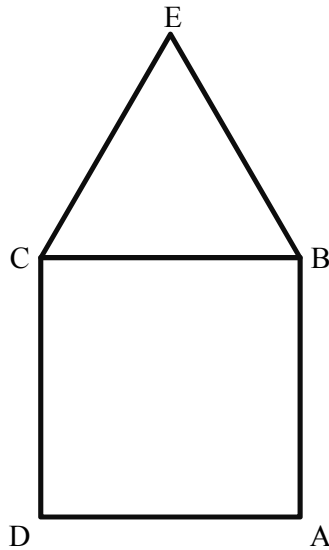
Class: \_\_\_\_\_



Track 2

**5** ABCD is a **square** and CBE is an **equilateral triangle**.

(a) Explain why  $\angle ABE = 150^\circ$ .



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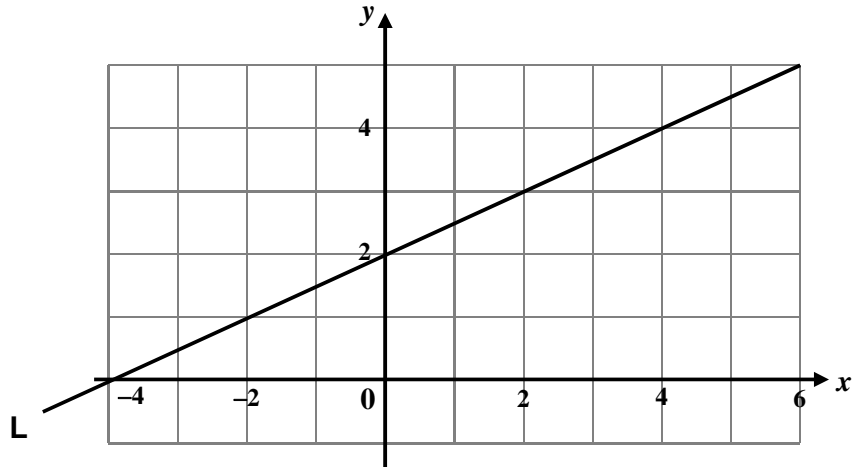
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(b) Prove that the triangles ABE and DCE are **congruent**.

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6 marks

- 6 The diagram below shows the graph of a straight line, **L**.



- (a) Work out the **gradient** of the **line** .

Gradient = \_\_\_\_\_

- (b) Write down the **equation** of the **line L**. \_\_\_\_\_
- (c) Another straight line, **M**, is **parallel** to line **L** and passes through (0, 6).  
Write down the **equation** of this line **M**.

\_\_\_\_\_

- (d) The line  $x = 10$  intersects the line **L** at the point P.  
Write down the coordinates of P.

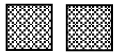
P ( \_\_\_\_ , \_\_\_\_ )

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8 marks



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



Track 2

7 420 tickets were sold at a concert. Some of the tickets cost €10 and the others cost €15. The total amount collected from the sale of the tickets was €5400. Let  $p$  represent the number of €10 tickets and  $q$  be the number of €15 tickets.

(a) Write down two equations in  $p$  and  $q$ .

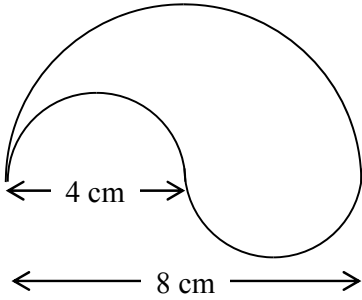
\_\_\_\_\_

(b) **Solve** these two equations to find the number of **cheaper tickets** sold.

Number of cheaper tickets = \_\_\_\_\_

6 marks

8 (a) Use your **compasses** to draw this shape.



(b) Work out the **perimeter** of the shape, correct to **1 decimal place**.

Perimeter = \_\_\_\_\_ cm

6 marks

- 9 (a) Oliver says: “The square root of a number is always smaller than the original number.” Is Oliver correct? Give a **reason** for your answer.

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- (b) Emma says: “All prime numbers are odd.” Is Emma correct? Give a **reason** for your answer.

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- (c) Tina says: “The square of every number is a positive number.” Is Tina correct? Give a **reason** for your answer.

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6 marks

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- 10 The following are the goals scored by six football teams:

25, 26, 82, 36, 39, 20

- (a) Work out the **mean**, **median** and **range** of this data.

Mean = \_\_\_\_\_ Median = \_\_\_\_\_ Range = \_\_\_\_\_

- (b) **Explain** why the **mean** is **not** suitable to represent the data.

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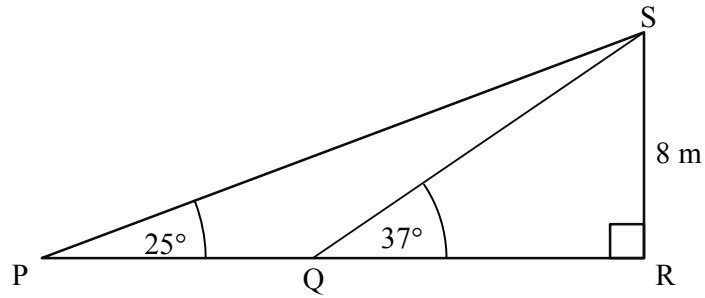
- (c) Can the **mode** be used to represent this data? Give a **reason** for your answer.

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8 marks

11 Work out, correct to 2 decimal places



(a) the length of QR

QR = \_\_\_\_\_ metres

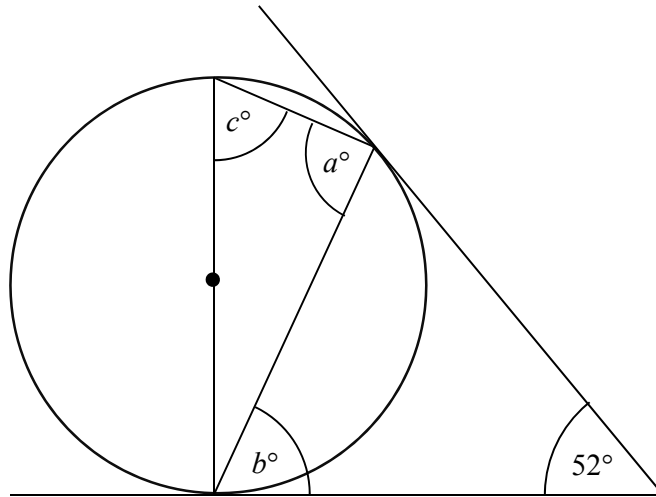
(b) the length of PQ

PQ = \_\_\_\_\_ metres

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8 marks

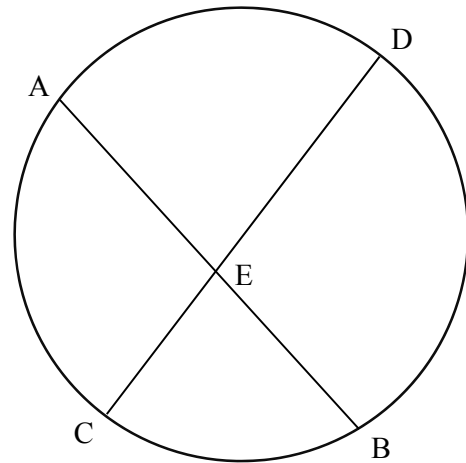
- 12 (a) (i) Explain why  $a = 90$ .



- (ii) Work out the size of angles  $b$  and  $c$ .

$b =$  \_\_\_\_\_  $c =$  \_\_\_\_\_

- (b) (i)  $AB$  and  $CD$  are two chords of a circle intersecting at  $E$ . Show that triangles  $ADE$  and  $CBE$  are **similar**.



- (ii)  $AD : CB = 3 : 2$  and  $BC = 4$  cm. Work out the length of  $AD$ .

$AD =$  \_\_\_\_\_ cm

13 A firm making furniture sold its products in the following countries.

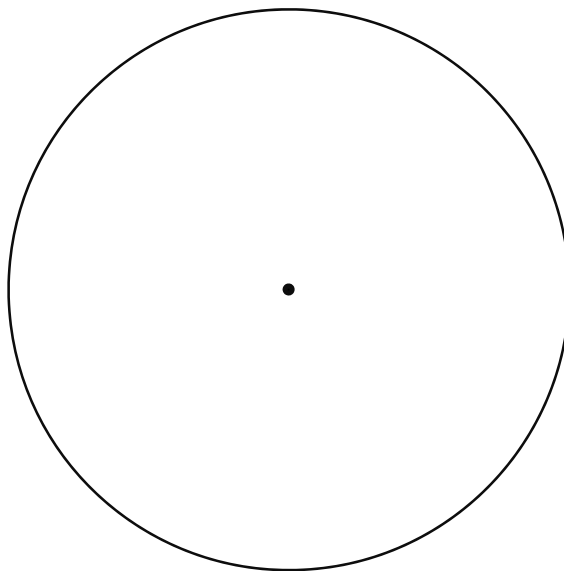
France	5%
Italy	10%
Greece	15%
Spain	40%
Other Countries	$x$ %

(a) What **percentage** of the firm's products was sold in other countries?

\_\_\_\_\_ %

(b) Complete the table below and use it to **draw** and **label** a **pie chart** representing this information.

<b>Country</b>	France	Italy	Greece	Spain	Other
<b>Angle</b>	18				



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8 marks

**END OF PAPER**