FORM 5   MATHEMATICS – SCHEME A (Non-Calculator Paper)   TIME: 20 minutes
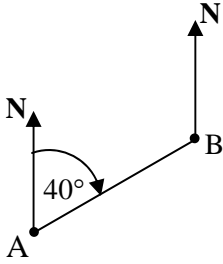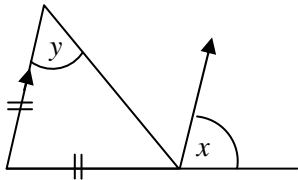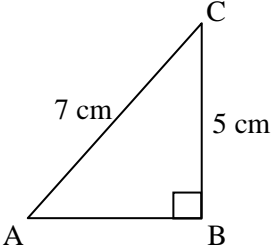
Name: _____   **Class:** _____

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	Write down the value of $1 - \dfrac{2}{3} \times \dfrac{3}{4}$. **Answer:** _____	
2	Write **thirty thousand and three** in figures. **Answer:** _____	
3	One of the angles of an **isosceles** triangle is 100°. What is the size of **each** of the other angles? **Answer**: _____	
4	Write down the **largest prime number** less than 40. **Answer:** _____	
5	A television programme starts at ten minutes to eight. It lasts twenty-five minutes. At what time does the programme finish? **Answer:** _____	
6	The sum of **all** the **factors** of 6 is: **A**. 5 **B**. 6 **C**. 11 **D**. 12 **Answer**: _____	
7	How many **minutes** are there in a whole day? **Answer:** _____	
8	**Subtract** 25 cm from 2 metres, giving your answer in **centimetres**. **Answer**: _____cm	

No.	Question	Space for Working
9	In an examination 60% of the maximum mark is required for a pass. The maximum mark is 200. What is the **pass mark**? **Answer:** _____	
10	A committee is made up of four men and a number of women. A chairperson is selected at random. The probability that the chairperson is a man is $\frac{2}{3}$. How many women are there in the committee? **Answer:** _____	
11	A car was bought for €10 000. After two years it was sold for €7 000. What is the **percentage loss**? **Answer:** _____	
12	Which **one** of the following is **not equal** to $\frac{1}{2}ab$? **A.** $\dfrac{ab}{2}$ **B.** $a\times\dfrac{b}{2}$ **C.** $b\times\dfrac{a}{2}$ **D.** $\dfrac{1}{2a}\times b$ **Answer**: _____	
13	**Simplify**: $\dfrac{6x^2}{5}\times\dfrac{15}{12xy}$ **Answer:** _____	
14	Given that $x = pr + q$, which **one** of the following is true? **A.** $r = \dfrac{x-q}{p}$ **B.** $r = x - q - p$ **C.** $r = \dfrac{x}{p+q}$ **D.** $r = \dfrac{x-p}{q}$ **Answer**: _____	

No.	Question	Space for Working
15	The value of $\left(\dfrac{1}{3}\right)^{-2}$ is **A**. $\dfrac{1}{9}$ **B**. $\dfrac{1}{6}$ **C**. 6 **D**. 9 **Answer**: _____	
16	The straight line $y = 2x - 3$ passes through **one** of the following points. Which one? **A**. (1, 1) **B**. (2, 1) **C**. (2, −1) **D**. (1, 2) **Answer**: _____	
17	The bearing of B from A is 040°. What is the **bearing** of **A from B**? **Answer:** _____	
18	Which **one** of the following is **true**? **A**. $x + y = 180°$ **B**. $x + y = 90°$ **C**. $x + 2y = 180°$ **D**. $x + 2y = 90°$ **Answer:** _____	
19	Given that AB = $\sqrt{x}$ cm, find the value of x. **Answer**: $x =$ _____	
20	Write the **missing number**: **2, 100%, 0.5, _____**	

FORM 5   **MATHEMATICS – SCHEME A (Main Paper)**   **TIME: 1h 40min**

| 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.   675 students attend Ħal Ballut Secondary School.
56% of these students are girls.
Two-thirds of the boys passed the mathematics examination.
(a) What **percentage** of pupils attending the school are **boy**s?
(b) How many **boys passed** the mathematics examination?

Answer: (a) _____,   (b) _____

_____(3 marks)

2.   The diagram shows the cross-section of a
swimming pool.
(a) Work out the **area** of the cross-section.
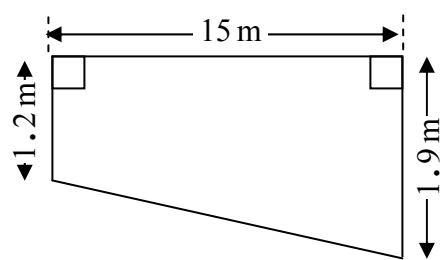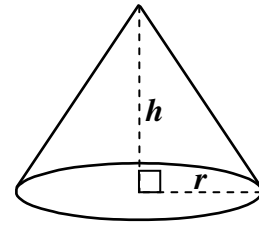

Area = _____ m^2

The length of the pool is 12 metres.
(b) Work out the **capacity**, in litres, of the pool. (1 m^3 = 1000 litres)

Capacity = _____ litres

_____(4 marks)

3. The volume of a cone is given by the formula $V = \dfrac{\pi r^2 h}{3}$.

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

$r =$ _____

(b) The volume of a cone is $124\,\text{cm}^3$ and its height is $6.7\,\text{cm}$.
Work out the value of r, correct to **1 decimal place**.
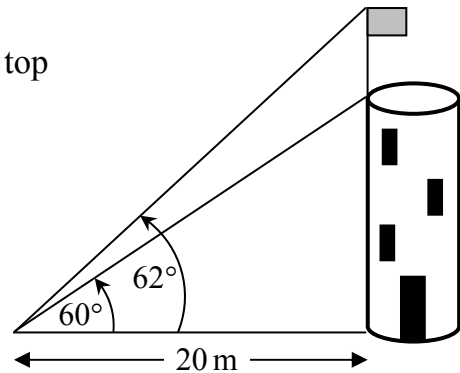
$r =$ _____ cm

_____(4 marks)

4. A man stands 20 metres away from a tower. He observes the angles of elevation of the bottom and top of a flagstaff standing on the tower as 60° and 62° respectively.
Work out, correct to **2 decimal places**:
(a) the **height** of the **tower**,
(b) the **height** of the **flagstaff**.

Answer: (a) _____ m, (b) _____ m

_____(5 marks)

5.   ABCD is a **square** and ABP is an **equilateral triangle**.
     (a) Prove that triangles ADP and BCP are **congruent.**

D   C

P

A   B
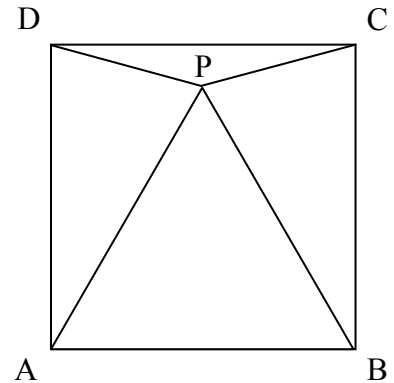
(b) Write down the size of ∠**DPC**.

∠**DPC** = _____

_____(5 marks)

6.   The LOGO statement draws a **regular polygon**.

PD REPEAT 6 [FD 50 RT 60]

(a) **Fill in**:

(i)   The polygon is a regular _____.

(ii) The **perimeter** of this polygon is _____ turtle steps.

(iii) The **order of rotational symmetry** of the polygon is _____.

(b) Complete the LOGO statement that will draw a **regular octagon** having a **perimeter** of **480** turtle steps.

PD REPEAT _____ [FD _____ RT _____]

_____(5 marks)

7. (a) Write down an **inequality** to describe the range of numbers shown on each of these number lines. **NOTE: (i) is worked out for you.**

(i)

$$-4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \qquad x$$

Answer: ___ $x \geq -1$ ___

(ii)

$$-4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \qquad x$$

Answer: _____

(iii)

$$-4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \qquad x$$

Answer: _____

(b) Solve the following inequality and illustrate your solution on the number line.

$$2 - 3x \geq 6 - x$$

$$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \qquad x$$

_____(5 marks)

8. (a) The table on the right shows a set of matching p and q values where p is **directly** proportional to the **cube** of q.

p	85.75	182.25	549.25
q	3.5	4.5	6.5

Use the values given to find a **formula** for p in terms of q. **Show all your working**.

Answer:_____

(b) The table on the right shows a set
of matching *s* and *t* values where
s is **inversely** proportional to *t*.

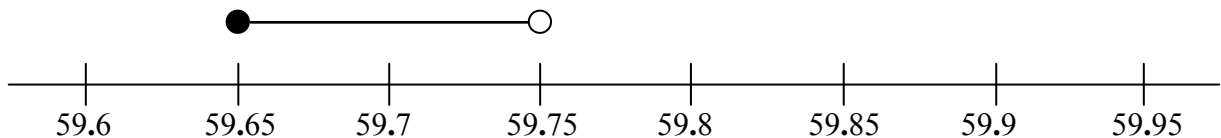| *s*	$\frac{1}{4}$	1	5
t	4	1	

    (i) Use the values given to find
      a **formula** for *s* in terms of *t*.

    (ii) Hence or otherwise write down the
       missing value in the table.

          Answer:_____

          Answer:_____

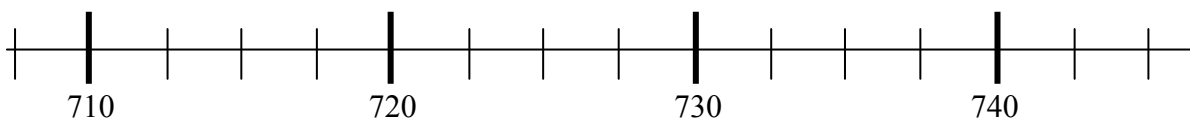--

(c) The **range** within which a number lies is shown on the number line.
To what accuracy, in **significant figures**, is the number given?

          Answer:_____

(d) Use the number line given to illustrate the **range** (lower and upper bounds) within
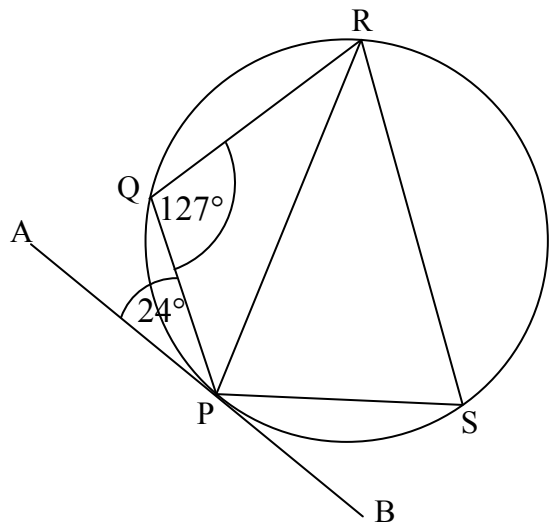which **730** lies, when given correct to **the nearest ten**.

_____(8 marks)

9. (a) P, Q, R and S are four points on the
circumference of the circle shown.
APB is a **tangent** to the circle at P.
Angle PQR = 127° and angle APQ = 24°.

**Show all your working and give reasons
for your answers.**

Find ∠QSR.

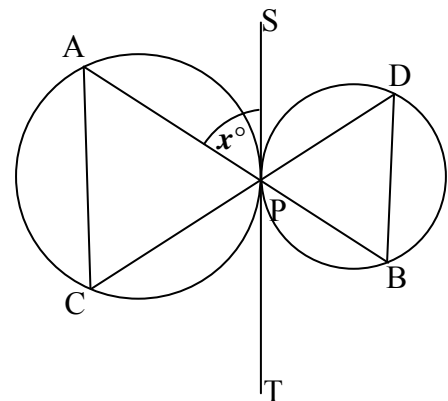--

(b) The diagram shows two circles **touching** at P.

APB and CPD are straight lines such that A
and C lie on one circle and B and D lie on the
other circle.

TPS is a **tangent** to **both** circles at P.

∠APS = $x°$.

Prove, **giving reasons**, that AC is **parallel** to BD.

_____(9 marks)

10. Two sisters, Maria and Carmen, are both sitting for their Mathematics SEC examination for the first time. Table 1 shows the probability that they will pass the exam at the **May** session.

	Probability of passing at **May** session
Maria	0.6
Carmen	0.7

Table 1

(a) Work out the probability that **both** Maria **and** Carmen will pass the exam at the **May** session.

Answer:_____

(b) Work out the probability that **only one** of the sisters will pass the exam at the **May** session.

Answer:_____

(c) Work out the probability that **at least one** of the sisters will pass the exam at the **May** session.

Answer:_____

Table 2 shows the probability that they will pass the exam at the September session, **if they fail at the May session**.

|	Probability of passing at **September** session, **if they fail** at **May** session
Maria	0.8
Carmen	0.7

Table 2

(d) Work out the probability that **Carmen** will pass the exam **either** at the **May** session **or** at the **September** session.

Answer:_____

_____(8 marks)

11. Patrick drives his car to work. He increases his velocity at a constant rate for the first 20 seconds (AB). He then travels at a steady velocity (BC).
He sees a speed camera sign which also shows a speed limit, so he slows down at a constant rate until he reaches a speed which is the **same** as the speed limit (CD).
He then continues driving at a steady velocity again (DE).
The diagram below shows Patrick's journey with corresponding line segments AB, BC, CD and DE.
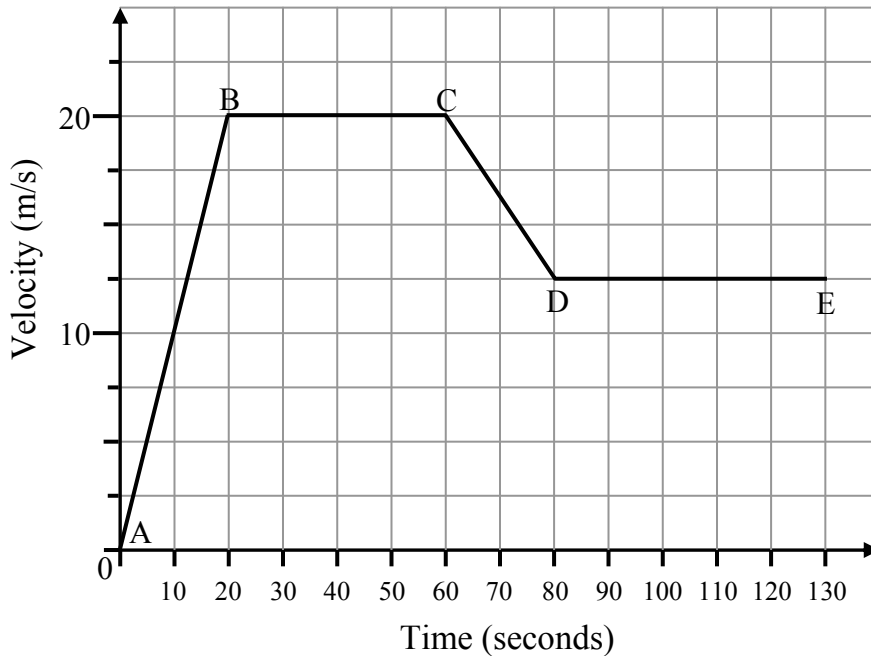
(a) Write down the **maximum** velocity during the journey, in **m/s**.

Answer: _____m/s

(b) Work out how **far** Patrick travels while travelling at the maximum velocity.
Give your answer in **metres**.

Answer: _____m

(c) What was the **speed limit** shown on the speed camera sign? Give your answer in **km/h and show all your working**.

Answer: _____ km/h

(d) Work out the **gradient** of line segment AB. **Explain** what the gradient of AB represents.

Answer: gradient = _____

_____(8 marks)

12. A group of **boys** took part in a sack race organised during a village fun day. The box plot **A** shows the distribution of the times in seconds taken by the **boys** to complete the race.

Box plot **A** (**Boys**)

Box plot **B** (**Girls**)
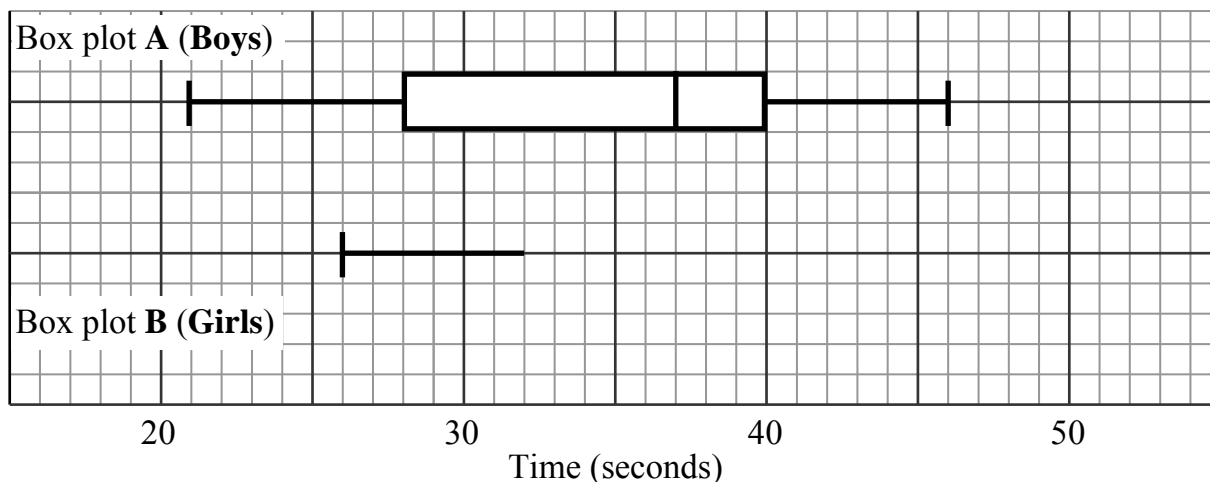
Time (seconds)

(a) What **percentage** of the **boys** took **more** than 40 seconds to complete the race?

(b) A different race for **girls** was also organised. Below is some information about the distribution of the times in seconds taken by the girls to complete the race.

> A **quarter** of the girls took 32 seconds or **less**, the **fastest** taking 26 seconds.
>
> A **quarter** of the girls took 43 seconds or **more**, the **slowest** taking 50 seconds.
>
> The **median** time was 42 seconds.

Complete box plot **B** to show this information.

(c) Which **one** of the following statements is **true**? **Explain** your answer by **referring** to the **box plots**.

(i) "The **boys'** times are generally **faster** than the girls' ".

(ii) "The **girls'** times are generally **faster** than the boys' ".

(d) The **central half** of the data shows that:
"the spread of the times for boys and girls are almost the same".

(i) What **feature** of the **box plots** shows that this statement is **true**?

(ii) What is the **central half** of the data called?
A) Upper quartile   B) Interquartile range   C) Median   D) Range

_____(8 marks)

13. The table shows values of x and y for $y = \dfrac{12}{x}$.

The values of x and y have been used to draw the graph of $y = \dfrac{12}{x}$ for values of x from -6 to -0.75.
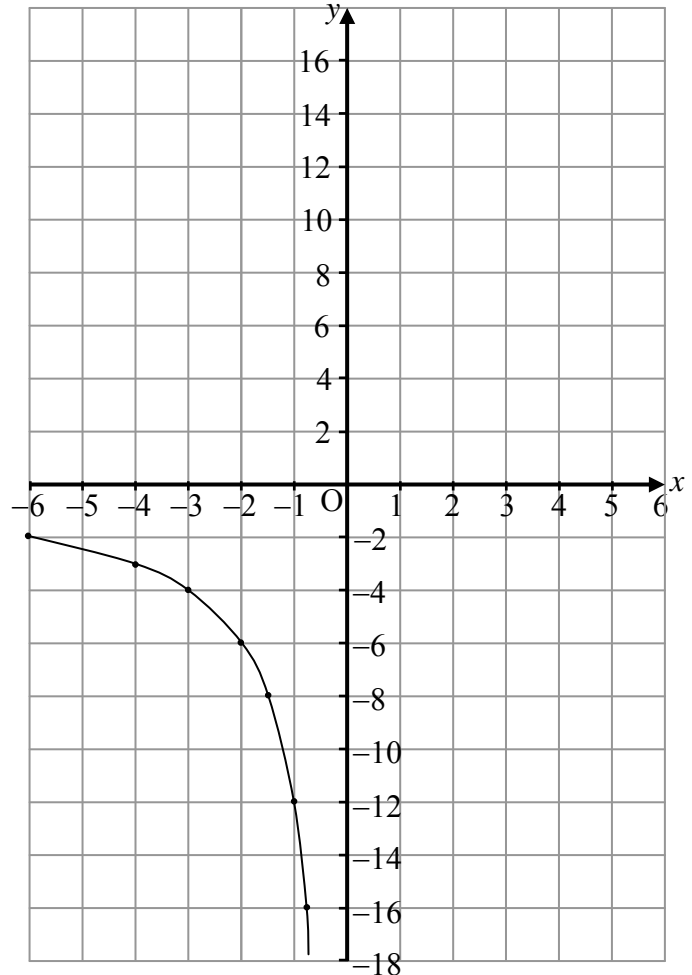
x	−6	−4	−3	−2	−1.5	−1	−0.75	0
y	−2	−3	−4	−6	−8	−12	−16	not defined

(a) On the same axes draw the graph of $y = \dfrac{12}{x}$ for values of x from 0.75 to 6.

(b) On the same axes draw the graph of $y = x^2$ for values of x from -4 to 4.

(c) **Explain how** you can use **your graphs** to find an **estimate** for the cube root of 12.

All working must be shown.

_____(8 marks)

END OF PAPER