Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination 2015
Sample Paper

Mathematics

Foundation Level

Time: 2 hours

300 marks

Examination number

Centre Stamp

Running total	

For examiner			
Question	Mark	Question	Mark
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8			
9			
10		Total	

Grade

Instructions

There are 17 questions on this examination paper. Answer **all** questions.

Questions do not necessarily carry equal marks. To help you manage your time during this examination, a maximum time for each question is suggested. If you remain within these times you should have about 10 minutes left to review your work.

Write your answers in the spaces provided in this booklet. You may lose marks if you do not do so. You may also ask the superintendent for more paper. Label any extra work clearly with the question number and part.

The superintendent will give you a copy of the *Formulae and Tables* booklet. You must return it at the end of the examination. You are not allowed to bring your own copy into the examination.

You will lose marks if all necessary work is not clearly shown.

You may lose marks if the appropriate units of measurement are not included, where relevant.

You may lose marks if your answers are not given in simplest form, where relevant.

Write the make and model of your calculator(s) here:

Question 1 **(Suggested maximum time: 5 minutes)**

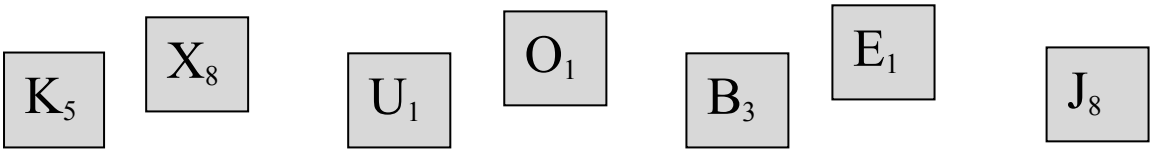
Find the value of:

(a) **(i)** $293 + 78 =$ _____

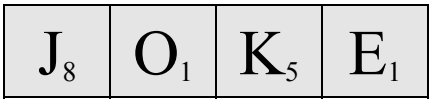
(ii) $38 \times 7 =$ _____

(b) In the game of *Scrabble*, players make words using individual lettered tiles. The points for each letter are written on the tile. To find the total score for a word, a player adds together the points for each tile used.

In a game, Maura picks these seven tiles.



She then arranges four tiles to form the word below.



(i) Find the total number of points that Maura would score for this word.

(ii) Liam looks at the same seven tiles but can only form a three-letter word worth 12 points. Write down a three-letter word that Liam might have chosen.

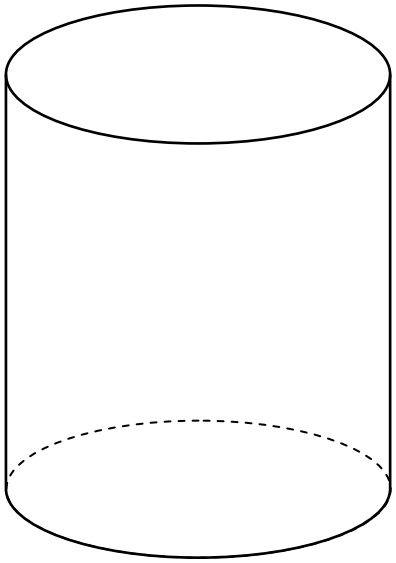
Question 2 **(Suggested maximum time: 5 minutes)**

(a) Estimate what fraction of the strip below is shaded.

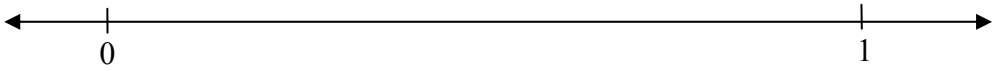
Answer: $\frac{\quad}{\quad}$

(b) Shade in $\frac{3}{4}$ of the strip below.

(c) Sketch the approximate height of water in the cylinder if the cylinder is $\frac{4}{5}$ full.



(d) **(i)** Show the numbers 0·6 and 0·4 on the number line below.

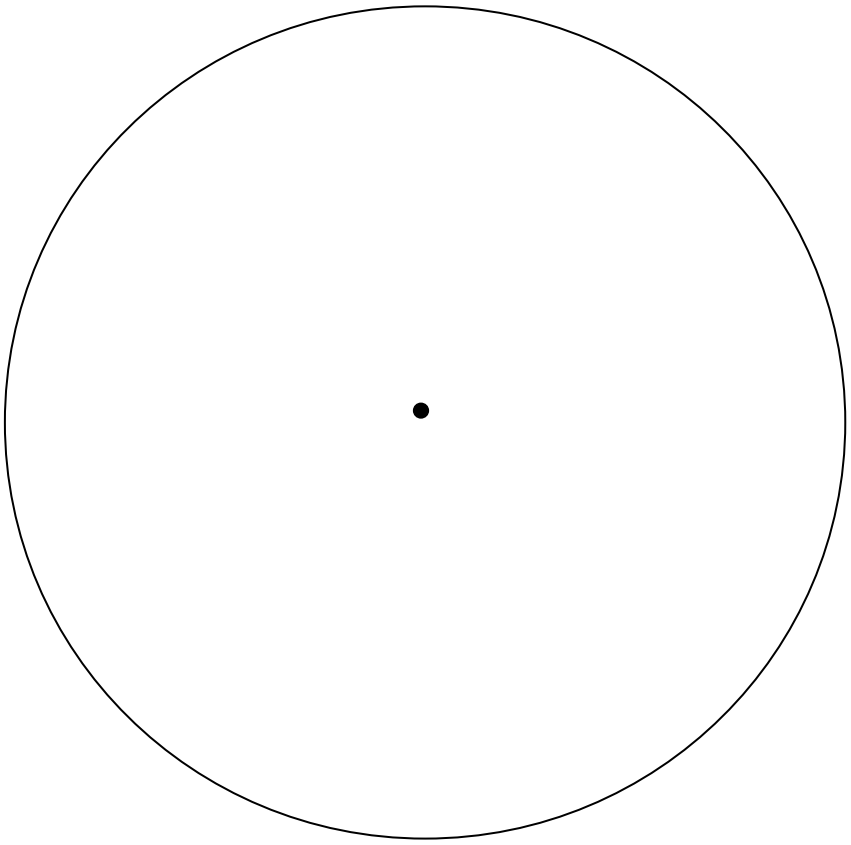


(ii) Which of these two numbers is bigger?

Question 3 **(Suggested maximum time: 5 minutes)**

(a) Measure and write down the **diameter** of the circle below.
Give your answer correct to the nearest cm.

Diameter = _____ cm



(b) Find the **radius** of the circle. Radius = _____ cm

(c) Calculate the **area** of the circle. Give your answer correct to one decimal place.

Question 4 **(Suggested maximum time: 10 minutes)**

Mary is planning to fly to London. The table shows the flights leaving Dublin Airport (DUB) and arriving in London Heathrow Airport (LHR) on a particular day.

Departing			Arriving	
DUB	06:40		LHR	08:05
DUB	07:30		LHR	09:05
DUB	08:50		LHR	10:15
DUB	09:50		LHR	11:10
DUB	12:10		LHR	13:25
DUB	13:40		LHR	14:55
DUB	14:40		LHR	15:55
DUB	15:50		LHR	17:10

(a) **(i)** Mary's flight leaves Dublin Airport at 07:30.
At what time will she arrive in London Heathrow Airport?

Answer:

(ii) Find how long her flight takes, in hours and minutes.

(iii) Mary would like to arrive in Dublin Airport an hour and a half before her flight leaves.
At what time should she arrive at the airport?

(b) The cost for Mary's journey is given in the table below.
Find how much the Baggage costs.

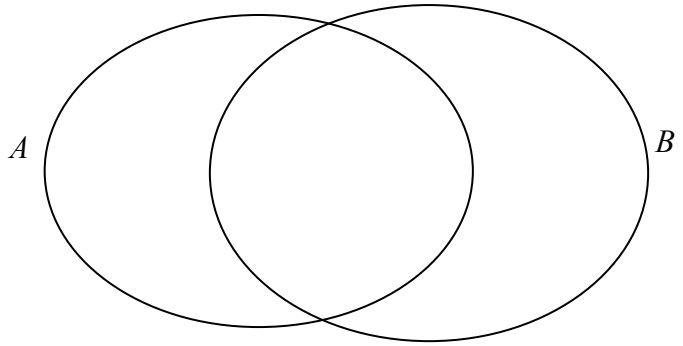
Cost (€)	
Fare	74·99
Taxes and Charges	33·99
Baggage	
Total	**133·98**

(c) Mary travels to the airport on a motorway at a steady speed of 100 km/h.
How long does it take her to travel 25 km at this speed?

Question 5 **(Suggested maximum time: 5 minutes)**

$A = \{c, e, l, w\}$ and $B = \{m, e\}$.

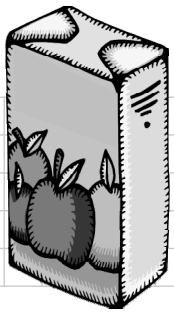
(a) Show the elements of the sets A and B on the Venn diagram below.



(b) List the elements of $A \cup B$. $A \cup B = \{ \quad , \quad , \quad , \quad , \quad \}$

Question 6 **(Suggested maximum time: 10 minutes)**

(a) A small juice carton is 2 cm wide, 4 cm long, and 8 cm high.
Calculate the volume of the carton.



(b) Draw a net of the carton.

Question 7 **(Suggested maximum time: 10 minutes)**

Sinéad has €12 in an account.

She decides to put €4 into the account each week for the following 20 weeks.

(a) Complete the table to show how much she will have saved at the end of each week for the first 6 weeks.

Week No.	Amount Saved (€)
0	12
1	16
2	
3	
4	
5	
6	

(b) How much will Sinéad have in the account at the end of 6 weeks?

(c) How much money will she have saved in 20 weeks?

(d) She would like to buy a cordless drill costing €30. How many weeks will she have to wait, from the time she starts, until she can afford to buy the drill?

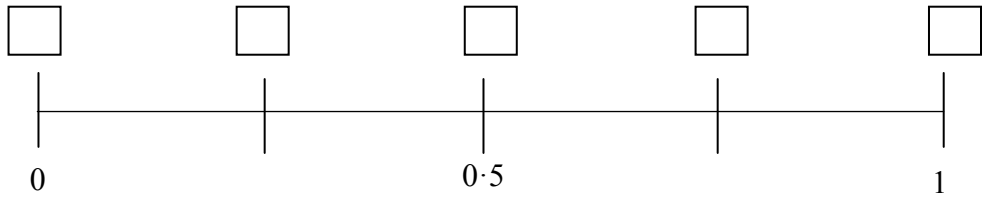
(e) Write down in words how you would find the amount in the account at the end of any given week.

Question 8 **(Suggested maximum time: 5 minutes)**

(a) Complete the table below to show the probability of each of the events **A**, **B**, **C**, **D**, and **E**.

Event	Probability
One card is picked at random from a pack of playing cards. **A** = The card is a diamond.	$\frac{13}{52} = \frac{1}{4}$
One name is picked at random from a list of 50 girls and 50 boys. **B** = A girl's name is picked.	
One day is picked at random from a list of the days of the week. **C** = The name of the day contains the letter **a**.	
One number is picked at random from the set $\{1, 3, 5, 6\}$. **D** = The number picked is an odd number.	
The three angles of a particular triangle are measured and added together. **E** = The answer is $100°$.	

(b) Write each of the letters **A**, **B**, **C**, **D**, and **E** in the correct box on the probability scale below to show the probability of each of these events.



Question 9 **(Suggested maximum time: 5 minutes)**

Sophie has a box with the following buttons:

3 yellow buttons
5 green buttons
7 red buttons
4 purple buttons
1 black button

(a) How many buttons are in the box?

Sophie takes a button from the box at random.

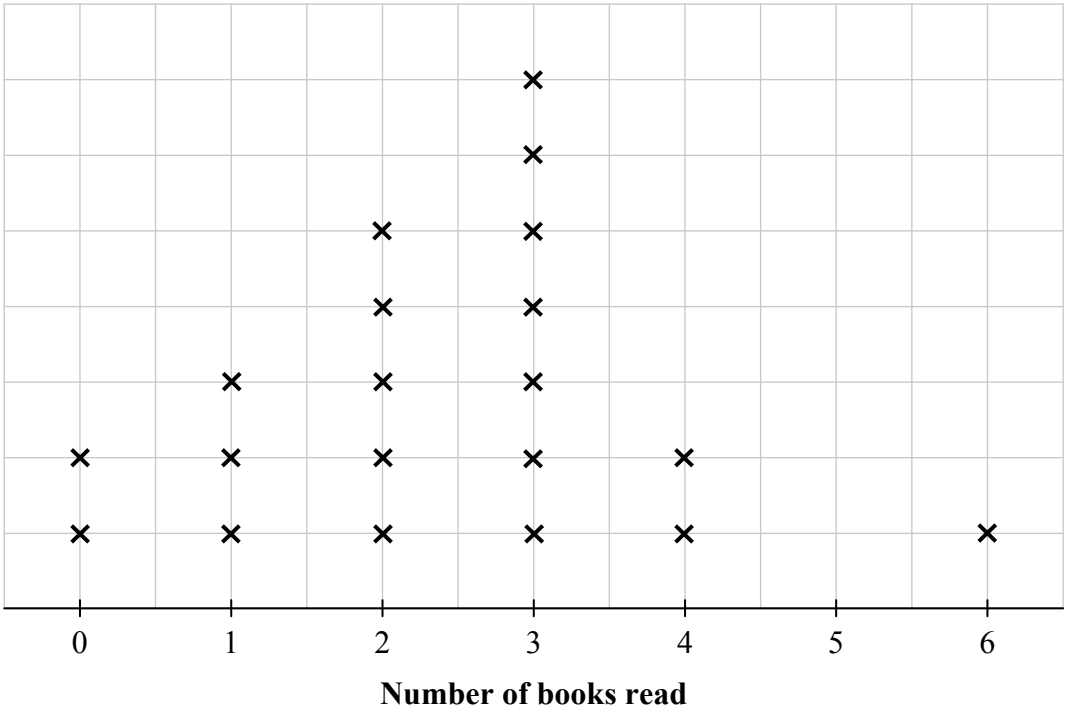
(b) What is the probability that she will get a black button?

(c) Write the missing colour in the sentence below.

The probability that Sophie will get a _____ button is $\frac{1}{4}$.

Question 10 **(Suggested maximum time: 5 minutes)**

Students in a class were asked how many books they had read in the previous month.
Some of the results are shown in the line plot below.



(a) How many students read **exactly 2 books** during the month?

Three students read exactly 5 books.

(b) Use this information to **finish the graph** above.

(c) How many students were in the class?

Question 11 **(Suggested maximum time: 5 minutes)**

These are the names of fifteen people on a youth club basketball squad.

Alex	Claire	Kevin	Yetunde	Brian
Claire	Lucy	Tom	Claire	James
Seya	Ryan	Jodi	Liam	Tom

(a) What name is the **mode**?

(b) One person leaves the squad. A different person joins the squad.
Now the **mode** is **Tom**.

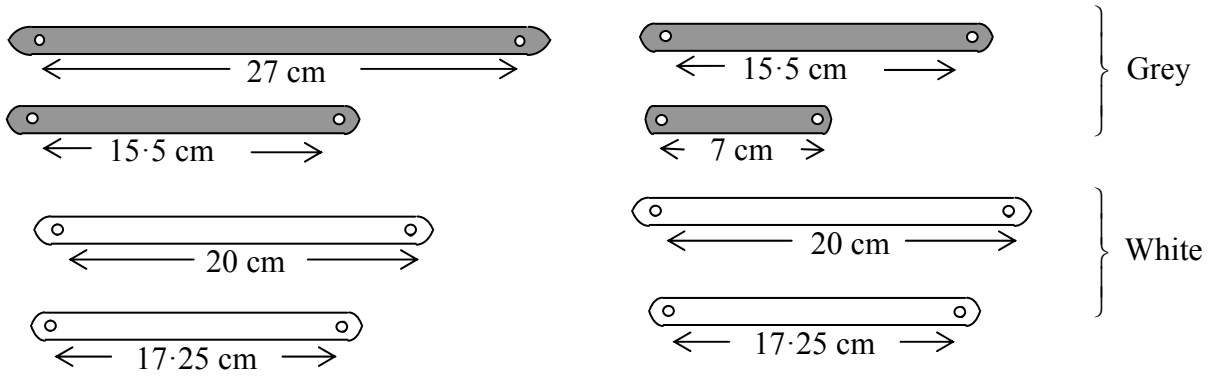
Write the missing names in the sentences below.

The name of the person who **leaves** is _____ .

The name of the person who **joins** is _____ .

Question 12 **(Suggested maximum time: 5 minutes)**

Mary has a set of plastic strips (long grey, middle grey, short grey, etc.).
These strips can be joined together with pins through small holes at their ends.

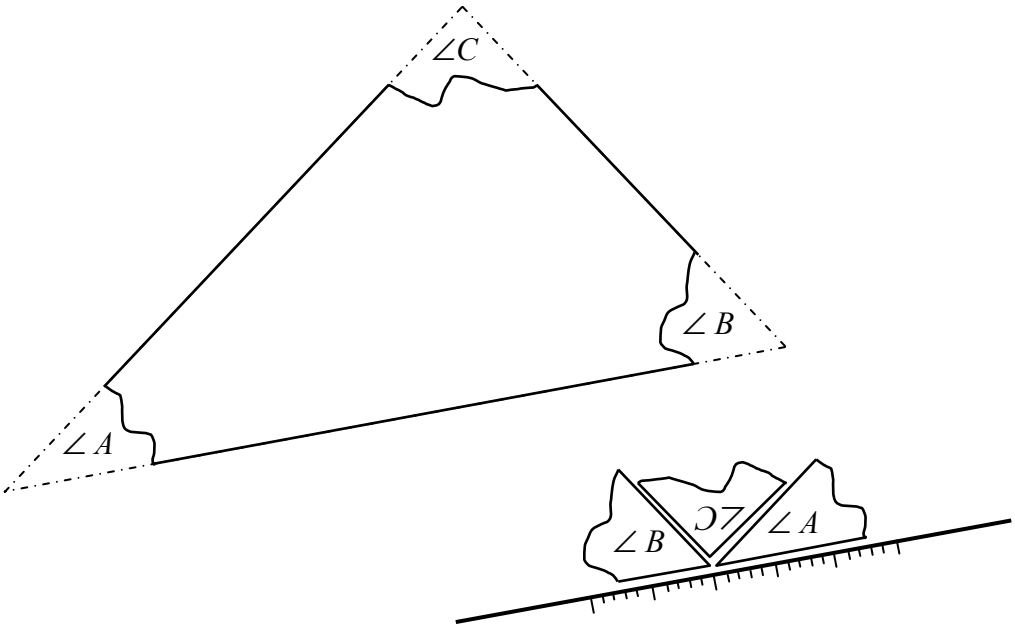


(a) Mary wants to make an isosceles triangle using three of the four grey strips.
Can she do this? Give a reason for your answer.

(b) Mary thinks that she can make a parallelogram by using the four white strips.
Can she do this? Give a reason for your answer.

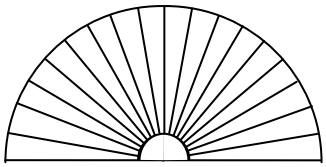
Question 13 **(Suggested maximum time: 10 minutes)**

In a classroom exercise, students cut out a triangle. They then tore off the corners and arranged them on a ruler as shown below.



(a) What do you think the students were trying to show?

(b) Describe another method to show the same result using a protractor.



(c) Do the methods above prove that this result is true for **all** triangles?
Give a reason for your answer.

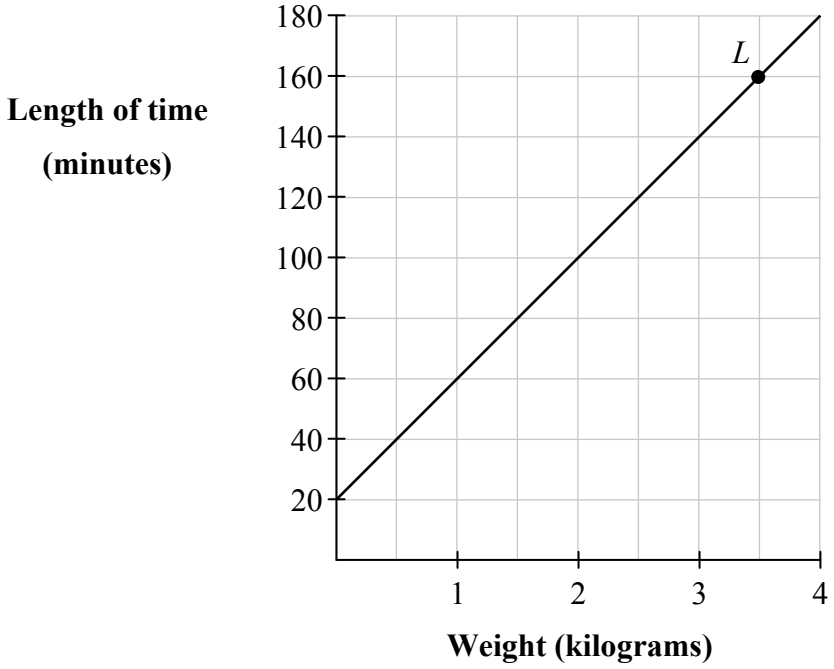
Question 14 **(Suggested maximum time: 5 minutes)**

A website gives these guidelines for cooking a turkey:

"Cook the turkey for 40 minutes for each kilogram, plus an extra 20 minutes."

(a) Katie has a turkey that weighs 2 kilograms. How many minutes should she cook it for?

(b) The graph shows the length of time needed to cook a turkey, using the same guidelines.



Laura's turkey is shown by the point L on the graph.
Write down the weight of Laura's turkey, and the number of minutes she should cook it for.

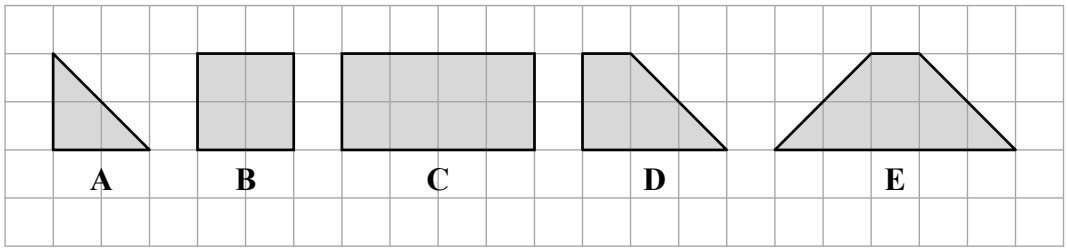
Weight = _____ kilograms

Length of time = _____ minutes

(c) Eoin cooks his turkey for 260 minutes. How many kilograms does Eoin's turkey weigh?

Question 15 **(Suggested maximum time: 5 minutes)**

Look at these five shapes and complete the sentences below.



(a) Shape _____ is the only shape with exactly three sides.

(b) Shape _____ is the only shape with no right angles.

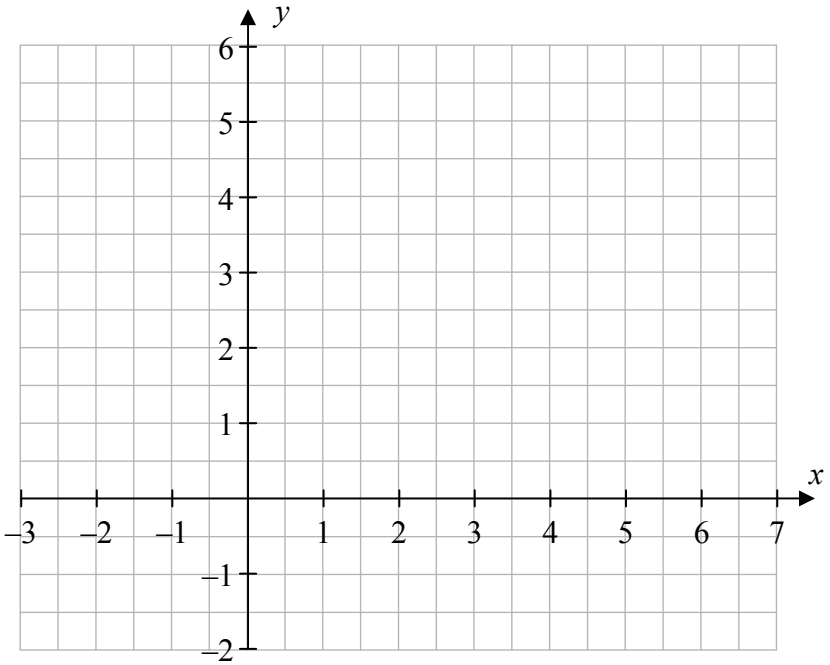
(c) Shape _____ is the only shape with no axes of symmetry.

(d) Shape B is the only shape with four _____ .

(e) Shape _____ could be formed by joining together two copies of shape _____ .

Question 16 **(Suggested maximum time: 10 minutes)**

(a) Plot the points $A(5, 1)$, $B(5, 3)$, $C(-1, 3)$, and $D(-1, 1)$ on the co-ordinate plane below.



(b) Join A to B, B to C, C to D, and D to A to form a shape.

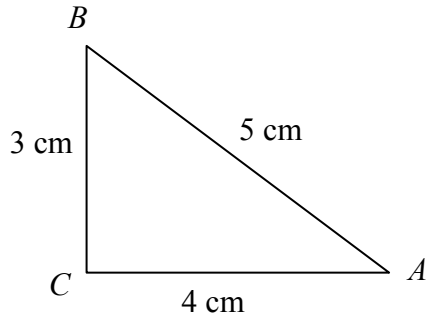
(c) What is this kind of shape called?

(d) Write down two properties of this shape.

(e) On your diagram above, draw one axis of symmetry of the shape.

Question 17 **(Suggested maximum time: 5 minutes)**

Jamie constructs the triangle ABC shown in the diagram.



(a) Use the Theorem of Pythagoras to show that $\triangle ABC$ is a right-angled triangle.

X is one of the angles in $\triangle ABC$, and $\sin X = \frac{4}{5}$.

(b) Mark in the angle X on the diagram above.

Note to readers of this document:

This sample paper is intended to help candidates and teachers prepare for the June 2015 and subsequent Junior Certificate examinations in *Mathematics*.

The number of questions on the examination paper may vary somewhat from year to year.

Junior Certificate 2015 – Foundation Level

Mathematics

Sample Paper
Time: 2 hours