Amended version

2012. M126 S

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2012
Sample Paper

Mathematics
(Project Maths – Phase 1)

Paper 2

Foundation Level

Time: 2 hours, 30 minutes

300 marks

Examination number

Centre stamp

Running total	

For examiner	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
Total	

Grade

Instructions

There are **three** sections in this examination paper:

Section A	Concepts and Skills	100 marks	4 questions
Section B	Contexts and Applications	100 marks	2 questions
Section C	Area and Volume (old syllabus)	100 marks	2 questions

Answer **all eight** questions, as follows:

In Section A, answer:

Questions 1 to 3 and

either Question 4A **or** Question 4B.

In Section B, answer Questions 5 and 6.

In Section C, answer Questions 7 and 8.

Write your answers in the spaces provided in this booklet. There is space for extra work at the back of the booklet. 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 booklet of *Formulae and Tables*. You must return it at the end of the examination. You are not allowed to bring your own copy into the examination.

A sheet of formulae will also be given to you by the superintendent.

Marks will be lost if all necessary work is not clearly shown.

Answers should include the appropriate units of measurement, where relevant.

Answers should be given in simplest form, where relevant.

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

Section A	Concepts and Skills	100 marks

Answer **all four** questions from this section.

Question 1 **(25 marks)**

(a) Fiachra is buying a new laptop computer.

The different choices of memory, screen type and colour are shown below.

Memory	Screen Type	Colour
1 GB RAM	Regular screen	Black
3 GB RAM	Widescreen	Red
		White

All of the different combinations are possible. For example, Fiachra could order a white 3 GB laptop with regular screen.

How many different versions of the laptop are possible?

(b) Seán's French teacher gives tests that are marked out of 10.
Seán got the following results in five tests:

7, 5, 6, 10, 7

(i) Find Seán's mean mark for the five tests.

Answer: _____

(ii) Áine got the following results in the same five tests. She was not in for the fourth test.

8, 5, 7, - , 7

Is Áine better or worse than Seán at French? Give a reason for your answer.

Answer: _____

Reason:

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Question 2 **(25 marks)**

The table below shows the amount of money spent by a group of students in one month on credit for their mobile phones.

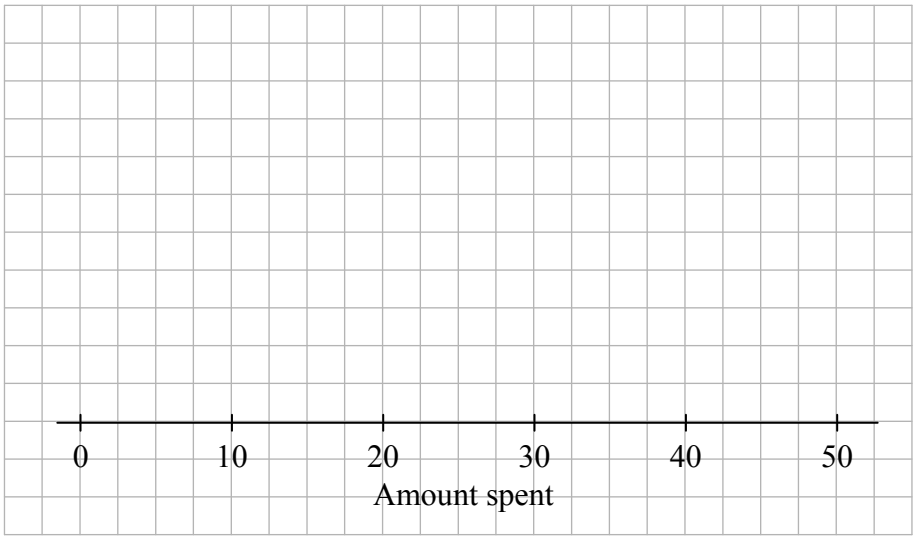
Amount spent in €	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Number of students	8	10	8	4	2

Note: each interval includes the lower boundary but not the upper one.

(a) How many students were in the group?

Answer: _____

(b) Illustrate the data on a histogram.



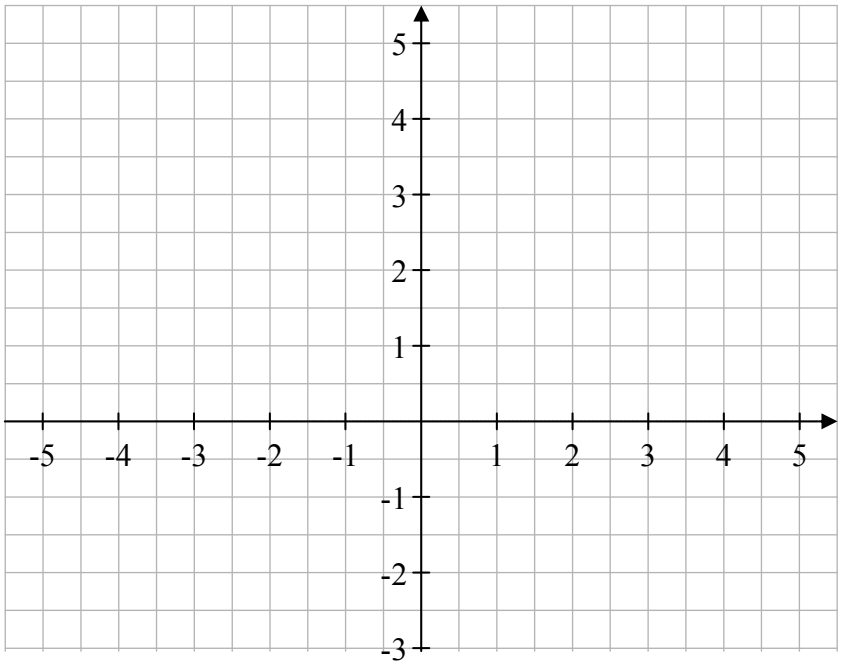
(c) Using the table and/or the histogram to help you estimate, complete this sentence:

"On average, these students spend about _____ per month on phone credit."

(d) Michael spent €27 on phone credit that month. Describe in one sentence Michael's phone spending compared to the others in the group.

Question 3 **(25 marks)**

(a) $P(5, 2)$ and $Q(-3, 4)$ are two points. Plot P and Q on the co-ordinate diagram below.



(b) R is the midpoint of $[PQ]$. Find the co-ordinates of R.

(c) Find the slope of the line PQ.

(d) Find the equation of the line PQ.

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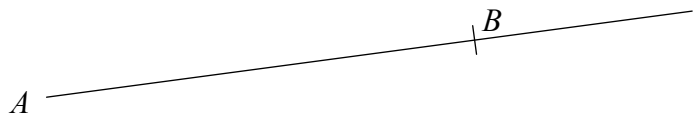
Question 4 **(25 marks)**

Answer **either** 4A **or** 4B.

Question 4A

Without using a protractor or setsquare, construct an angle of 60° below.
The vertex of the angle should be at A, and one arm should lie along AB.
Show all construction lines clearly.

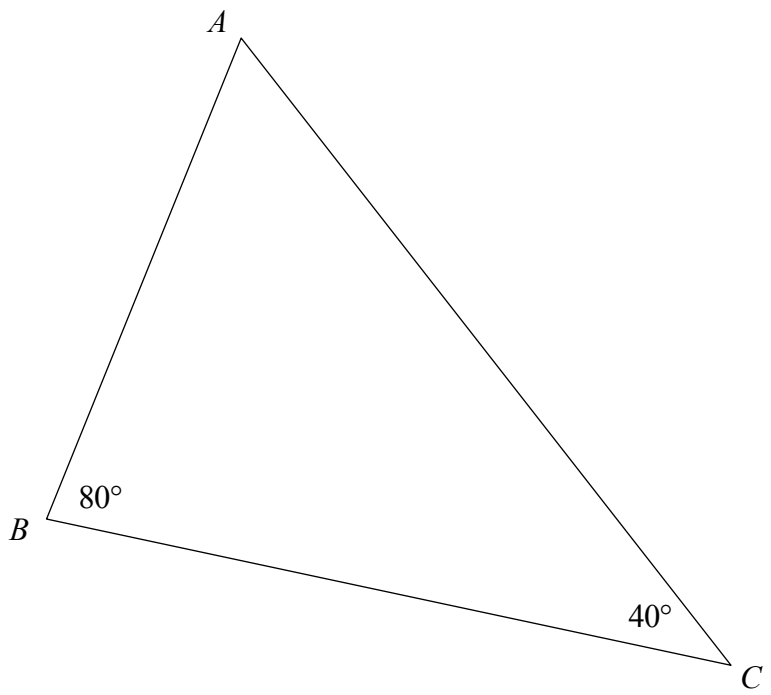


Describe here the steps in the construction:

OR

Question 4B

In the triangle ABC, $|\angle ABC| = 80°$ and $|\angle ACB| = 40°$, as shown.



(a) Construct the bisector of $\angle BAC$, without using a protractor.

(b) The bisector that you drew in part **(a)** meets the side [BC] at D. Mark and label the point D.

(c) By measuring as accurately as you can, verify that $|BD| = |AC| - |AB|$.

$|BD|$ = _____, $|AC|$ = _____, $|AB|$ = _____.

Verification:

(d) Do you think that the result that you verified in part **(c)** is true for every triangle?
Justify your answer.

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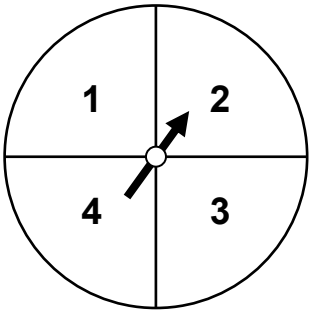
Section B	Contexts and Applications	100 marks

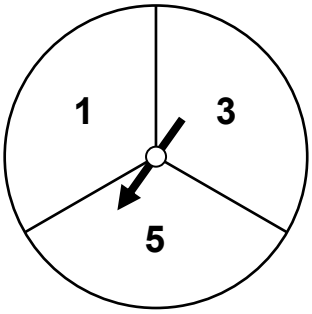
Answer Question 5 and Question 6 from this section.

Question 5 **(50 marks)**

A game at a festival involves two spinners. They are spun at the same time and the numbers added. The spinners are fair. (That is, the arrow is just as likely to stop in one sector as in any other.)

Players get a prize if they spin a total equal to four.





(a) The table below is partly completed. It shows the total scores for the different ways the spinners could land. Complete the table.

		first spinner			
		1	**2**	**3**	**4**
second spinner	**1**		3		5
	3		5	6	
	5	6			

(b) Sue plays the game once. Find the probability that she will get a total score of nine.

Answer: _____

(c) Find the probability that Sue will win a prize, (that is, get a score of four).

Answer: _____

(d) Which of the following best describes Sue's chances of winning a prize?

Write the letter corresponding to the correct answer in the box.

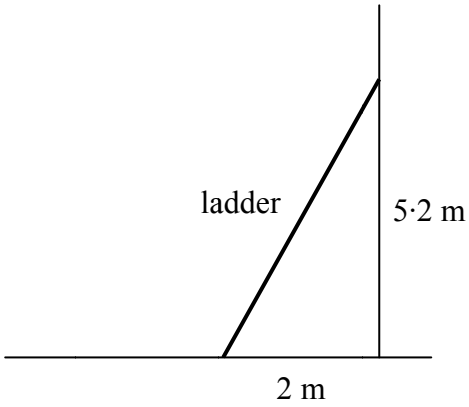
A. Impossible
B. Not very likely
C. About 50% likely
D. Very likely
E. Certain

(e) From watching other people play the game, Sue thinks that the second spinner is not fair after all. She thinks that it is more likely to point to five than to the other two numbers.

Describe how she could find the true probability of getting a five with that spinner.

Question 6 **(50 marks)**

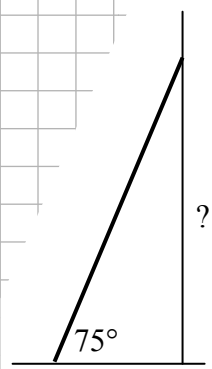
Michael places a ladder against the side of a building to do some work. The top of the ladder is 5·2 metres from the ground, and the bottom of the ladder is 2 metres out from the wall, as shown in the diagram below.



(a) Find the length of the ladder, correct to one decimal place.

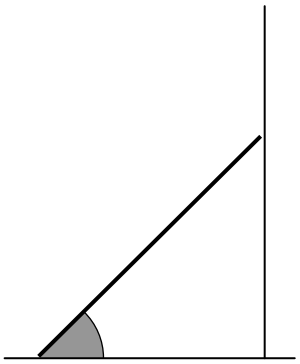
(b) John tells Michael that the ladder is not safe at that angle. He says that the angle between the ladder and the ground should be as close as possible to 75°.

If Michael puts the ladder at the correct angle, how far up the wall will it reach?

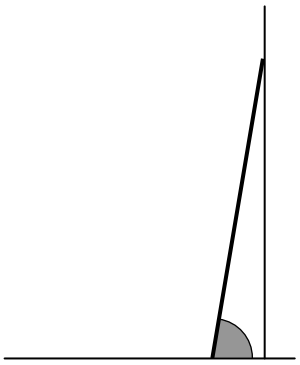


(c) There are reasons why a ladder is supposed to be set up at the correct angle.
Name one dangerous thing that could happen if the angle between the ladder and the ground is too small, and one dangerous thing that could happen if the angle is too big.

If the angle is too small, then



If the angle is too big, then

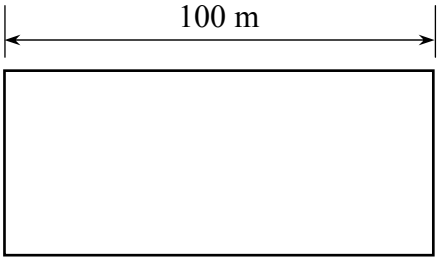


Section C — Area and Volume (old syllabus) — 100 marks

Answer Question 7 and Question 8 from this section.

Question 7 **(50 marks)**

(a) The perimeter of a rectangular field is 280 m.
The length of the longer side is 100 m.

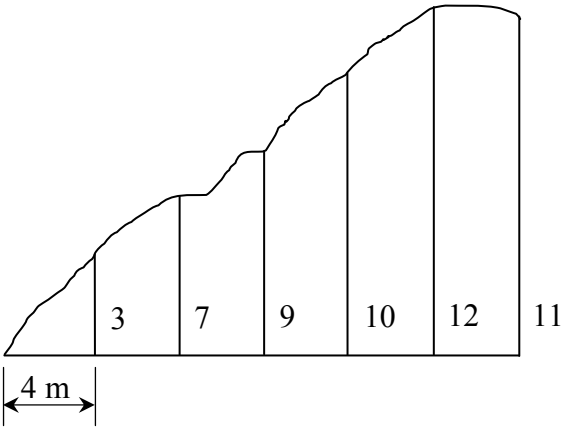


(i) Find the length of the shorter side.

(ii) Find the area of the field.

(b) The diagram shows a garden.

Offsets of lengths 3, 7, 9, 10, 12 and 11 metres are measured at intervals of 4 metres, as shown.



(i) Use Simpson's rule to estimate the area of the garden.

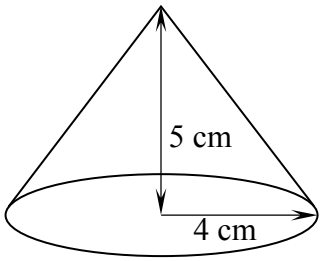
(ii) A flower bed takes up 25% of the area of the garden.
Calculate the area of this flower bed.

Question 8 **(50 marks)**

(a) The diagram shows a cone with a height of 5 cm and a base radius of 4 cm.

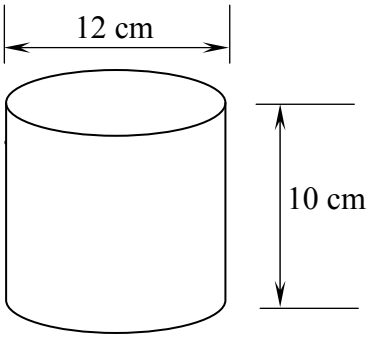
Calculate the volume of this cone.

Give your answer correct to the nearest whole number.



(b) The length of the diameter of the empty cylinder in the diagram is 12 cm and the height is 10 cm.

(i) Calculate the volume of the cylinder in terms of π.



(ii) A volume of $288\pi \text{ cm}^3$ of liquid is poured into this cylinder.

Calculate the height of the liquid in the cylinder.

(iii) What percentage of the total volume of the cylinder has no liquid in it?

You may use this page for extra work.

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Note to readers of this document:

This sample paper is intended to help teachers and candidates prepare for the June 2012 examination in *Mathematics* under Phase 1 of *Project Maths*. The content and structure do not necessarily reflect the 2013 or subsequent examinations.

Questions 7 and 8 in Section C correspond to Questions 1 and 2 on Paper 2 of the previous syllabus. They will be similar in style and content to previous such questions, other than being presented in a format suitable for a question-and-answer booklet. On this sample paper, the corresponding questions from the 2009 examination have been inserted to illustrate.

For the examination of 2012, Paper 1 remains unchanged in both content and format.

Leaving Certificate – Foundation Level

Mathematics (Project Maths – Phase 1) – Paper 2

Sample Paper, 2012
Time: 2 hours 30 minutes