Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2013

Mathematics
(Project Maths – Phase 1)

Foundation Level

Friday 7 June Afternoon 2.00 to 4.00

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		18	
9		19	
10		Total	

Grade

Instructions

There are 19 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. 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 *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.

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:

Question 1 **(suggested maximum time: 2 minutes)**

(a) $4 + 9 =$ _____

(b) $25 \times 11 =$ _____

(c) $107{\cdot}8 - 63{\cdot}5 =$ _____

(d) $4{\cdot}9 \div 0{\cdot}7 =$ _____

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

(a) Write $21{\cdot}2$ to the nearest whole number. ☐

(b) Write $6{\cdot}8$ to the nearest whole number. ☐

(c) Use your answers from **(a)** and **(b)** to estimate the value of $\frac{21{\cdot}2}{6{\cdot}8}$.

$\frac{21{\cdot}2}{6{\cdot}8}$ is approximately equal to $\frac{\square}{\square}$ = ☐

(d) Use your calculator or otherwise to find the value of $\frac{21{\cdot}2}{6{\cdot}8}$ correct to one decimal place.

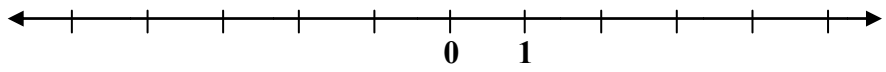
Question 3 **(suggested maximum time: 2 minutes)**

(a) Write the following decimal numbers in order, starting with the smallest and ending with the largest.

$0{\cdot}4, \quad 11{\cdot}1, \quad 3{\cdot}2, \quad 0{\cdot}08,$

Part (b) on next page

(b) On the number line below, mark in the integers $2,\ -1,\ 4,\ -3$.



Question 4 **(suggested maximum time: 2 minutes)**

The five coins below add to €3·72. What is the value of each of the missing coins?

Answer: _____ and _____

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

A lawnmower costs €200 excluding VAT.
If the VAT rate is 23%, find the total cost of the lawnmower.

Cost of Lawnmower =	€
VAT @ 23% =	€
Total Cost =	€

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

Mark bought two pairs of jeans and three tee shirts.
The jeans cost €35 per pair and the tee shirts cost €12 each.

(a) Find the total cost of Mark's purchases.

2 pairs of jeans @ €35 per pair =	€
3 tee shirts @ €12 each =	€
Total Cost =	€

(b) Mark paid with three €50 notes. How much change did he receive?

One pair of jeans was blue and the other pair was black. One tee shirt was green in colour, the second was red and the third was yellow.

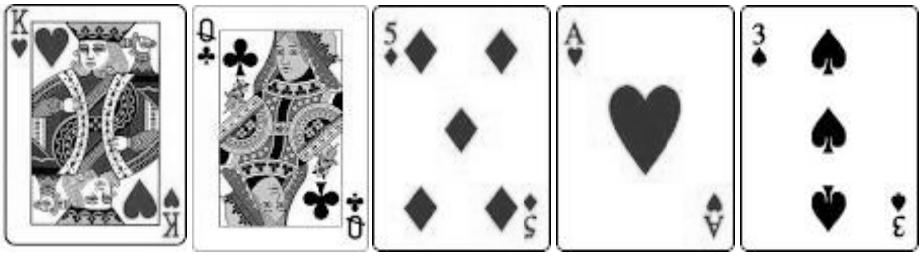
(c) If Mark selected one tee shirt at random from the three that he bought, what is the probability that he would select a red tee shirt?

(d) List all the different outfits consisting of jeans and a tee shirt that Mark could wear.

Outfit	Jeans	Tee Shirt
1	Blue	Green
2		
3		
4		
5		
6		

(e) What is the probability of Mark selecting blue jeans and a yellow tee shirt?

Question 7 **(suggested maximum time: 2 minutes)**



(a) A card is picked at random from the five cards above.

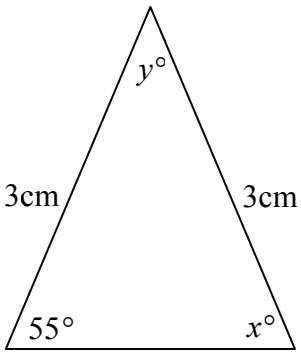
What is the probability of picking

(i) a King?

(ii) a King or a Queen?

(b) What fraction of the five cards above are hearts?

Question 8 **(suggested maximum time: 2minutes)**



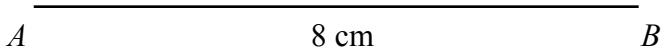
(i) Write down the value of x. $x =$ _____

(ii) Find the value of y. $y =$ _____

Question 9 **(suggested maximum time: 10 minutes)**

(a) Explain what it means to say that a triangle is *equilateral*.

(b) Construct a triangle ABC with $|AB| = 8$ cm, $|BC| = 8$ cm and $|AC| = 8$ cm.
Show all your construction lines.



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

(a) $\sqrt{121}$ = _____

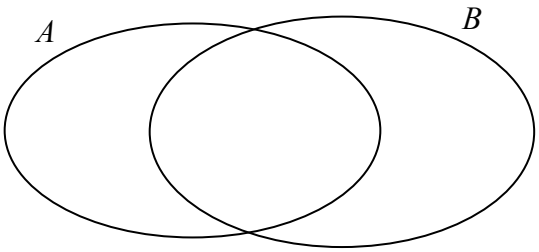
(b) $5 + 6 \times 9$ = _____

(c) 4^3 = _____

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

$A = \{m, n, s, w\}$ and $B = \{f, n, r, p, s\}$.

(a) Fill in the Venn diagram below.



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

(c) List the elements of $A \cap B$ $A \cap B = \{\quad , \quad \}$

Question 12 **(suggested maximum time: 15 minutes)**

A local shopkeeper records the number of ice creams of different flavours sold on the 15th of May. The results are:

Ice Cream Flavour	**Strawberry**	**Chocolate**	**Vanilla**	**Mint**
Number sold	9	16	11	4

(a) How many ice creams were sold that day? _____

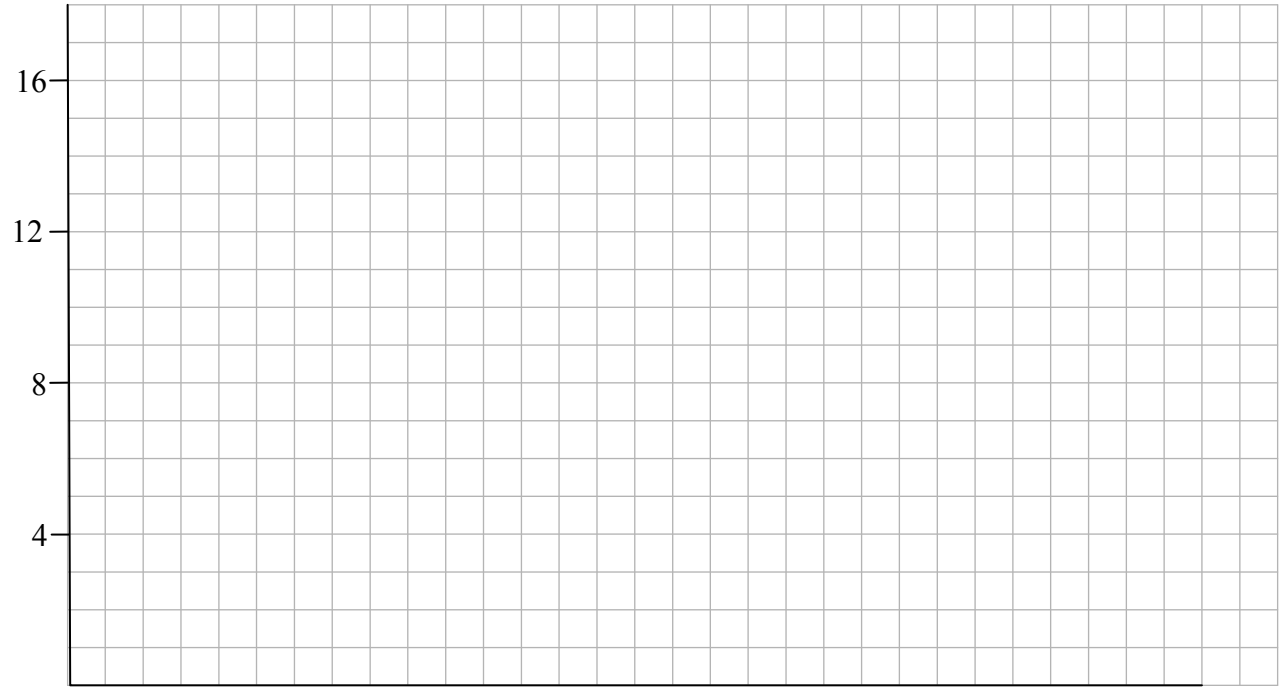
(b) Which flavour of ice cream was the mode? Give a reason for your choice.

Mode =
Reason:

(c) What was the mean number of ice cream flavours sold per flavour?

(d) Express the number of mint ice creams sold as a percentage of the total.

(e) Draw a bar chart to show the different flavours of ice cream sold on the 15th of May.



(f) If the shopkeeper recorded ice cream sales on the 15th of November, how would you expect the data to differ? Give a reason for your answer.

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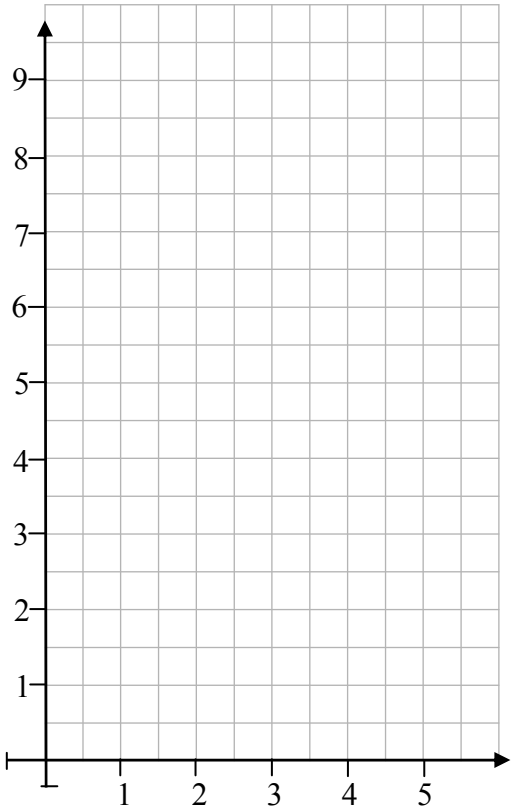
Question 13 **(suggested maximum time: 10 minutes)**

$A(1, 3)$ and $B(5, 9)$ are two points.

(a) Plot the points A and B on the co-ordinate plane below.



(b) Find the co-ordinates of C, the midpoint of $[AB]$.

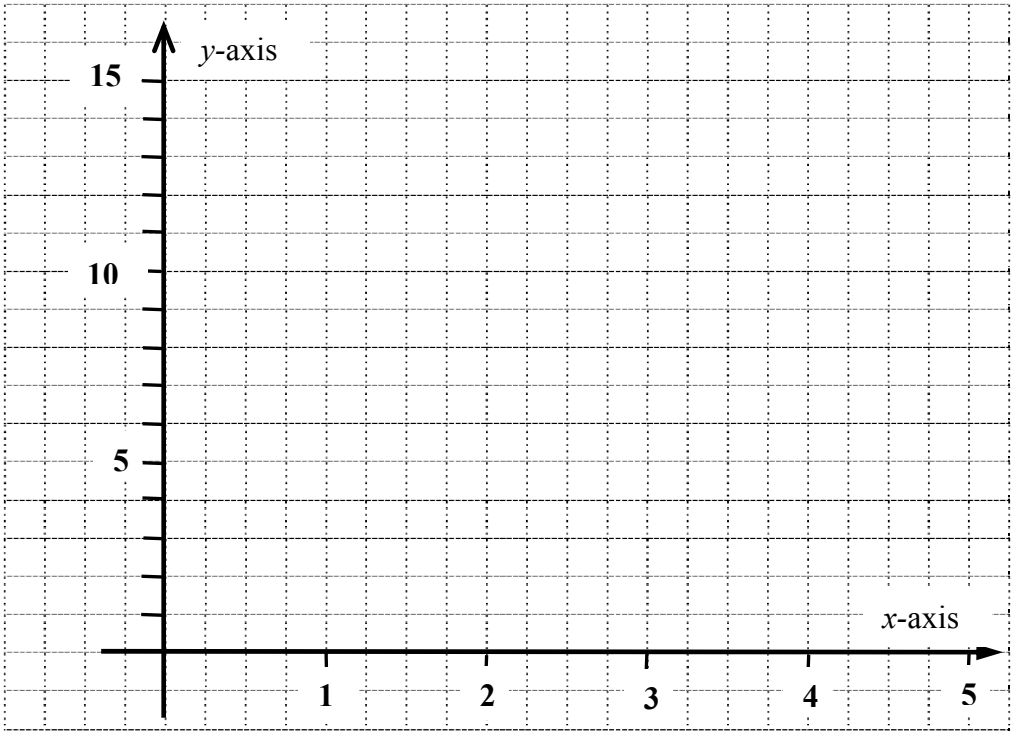
(c) Find the slope of AB.

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

(a) Given that $y = 2x + 5$, complete the table below. Show all your work.

x	1	2	3	4
y			11	

(b) Using your answers from **(a)**, draw the graph of $y = 3x + 1$ from $x = 1$ to $x = 4$



(c) Use your graph to find the value of y when $x = 1{\cdot}5$. Show work on graph.

$y =$

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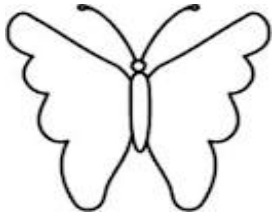
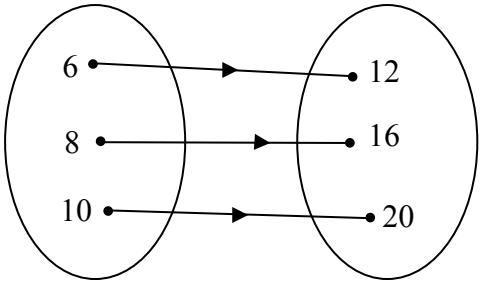
Question 15 **(suggested maximum time: 2 minutes)**

Draw the axis of symmetry of the following shape:



Question 16 **(suggested maximum time: 2 minutes)**

List the couples of the arrow diagram shown below.



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

(a) Find the value of $4a - 2b$, where $a = 3$ and $b = 1$.

(b) Simplify $x + 7y + 10x - 15y$

(c) Simplify $3(4x - 2y + 1)$

Question 18 **(suggested maximum time: 5 minutes)**

(a) $\frac{1}{4}+\frac{1}{3}$ is written as a single fraction.

Which fraction from the following list is the correct answer?

$\frac{2}{7}$, $\frac{7}{12}$, $\frac{1}{12}$.

Correct Answer =

(b) Solve for x: $4x = 44$

.

(c) Solve for x : $2(x - 2) = 10$.

Question 19 **(suggested maximum time: 15 minutes)**

Jessica went to Bulgaria on her summer holidays.

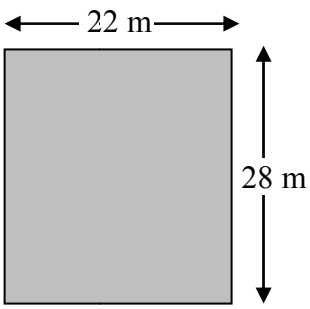
(a) The plane left Ireland at 8.15 am and landed in Bulgaria 3 hours 20 minutes later.
At what time did the plane land in Bulgaria?

(b) Jessica needed to purchase some local currency. She changed €600 into Bulgarian Leva.
The exchange rate was €1 = 1· 96 Bulgarian Leva.
How many Bulgarian Leva did Jessica receive?

Part (c) on next page

(c) The floor of the lobby of the hotel she stayed in was rectangular in shape. It measured 22 metres by 28 metres.

Calculate the area of the floor.

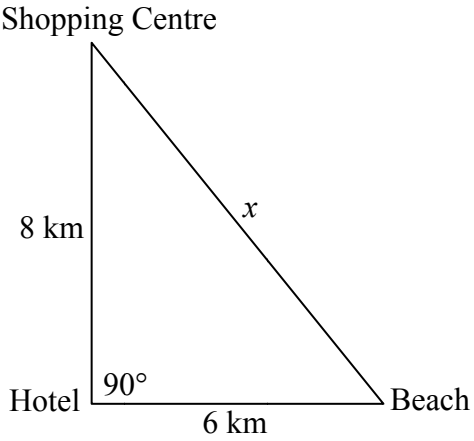


(d) There was a circular rug on the floor of the hotel lobby. It had a radius of 7 metres.

Calculate the area of the rug. Use $\pi = \frac{22}{7}$.

(e) When Jessica arrived at the hotel, she was told that the beach was 6 kilometres directly East and that the nearest shopping centre was 8 kilometres directly North.

The hotel receptionist drew the following map for her:



Using Pythagoras' Theorem, find the shortest distance (marked x in the diagram) from the shopping centre to the beach.

You may use this page for extra work.

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