Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination 2014

Mathematics
(Project Maths – Phase 2)

Foundation Level

Friday 6 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			
7			
8			
9			
10		Total	

Grade

Instructions

There are 15 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. 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.

You will lose marks 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: 5 minutes)**

(a) $3 + 8 =$

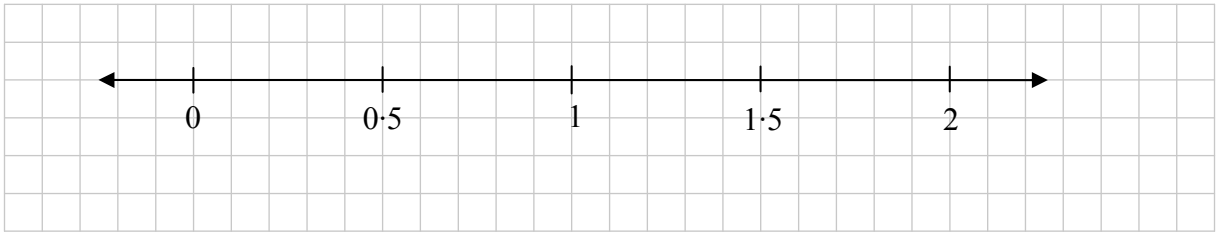
(b) $67 \times 8 =$

(c) $25{\cdot}8 - 13{\cdot}2 =$

(d) $12{\cdot}6 \div 3 =$

(e) On the number line below, mark in the following decimal numbers:

0·1, 0·9, 1·6.



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

Question 2 **(Suggested maximum time: 10 minutes)**

Barry went to the cinema last weekend.

(a) The film Barry saw started at 19:20 and finished at 21:38.
How long was the film? Give your answer in hours and minutes.

(b) Before the film, Barry bought a bag of sweets, a small popcorn, and a regular drink.

Part of the price list at the cinema is shown below.

Item	Price
Small Popcorn	€2·75
Medium Popcorn	€3·50
Large Popcorn	€4·25
Bag of Sweets	€2·90
Regular Drink	€2·20
Large Drink	€3·05

Complete the table on the right to find out how much Barry paid in total for these.

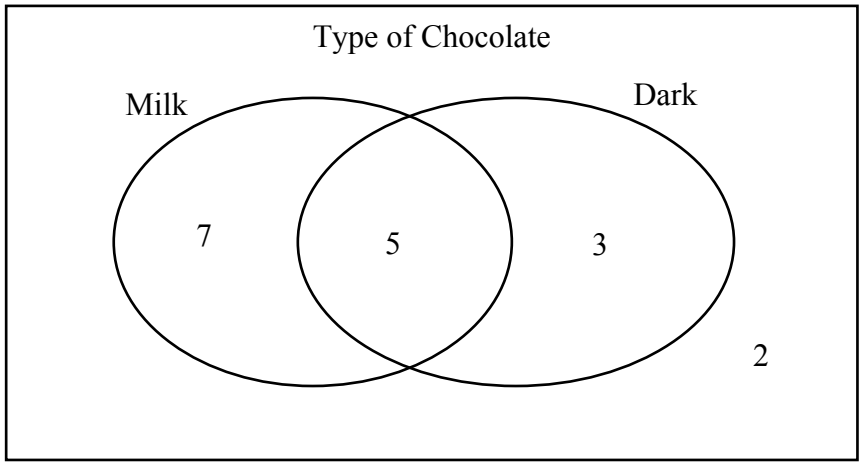
Item	Cost
One Bag of Sweets	€
One Small Popcorn	€
One Regular Drink	€
Total	€

(c) Barry went to the cinema with €20. His cinema ticket cost him €5·50.
How much change did Barry have after buying the cinema ticket, sweets, popcorn, and drink?

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

Seventeen people were asked if they liked milk chocolate (Milk) or dark chocolate (Dark).

The results are shown in the Venn diagram below.



(i) How many people liked both types of chocolate?

(ii) How many people did not like either type of chocolate?

(iii) How many people liked one type of chocolate only?

(iv) One person is picked at random from the group.

What is the probability that this person liked both types of chocolate?

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

Jackie and her family went to Edinburgh for a week on their holidays.

(a) They hired a car for the week.

The cost of hiring the car for 7 days was €78 per day, plus VAT at 15%.

Find the total cost of hiring the car for the week.

7 days @ €78 per day	€
VAT @ 15%	€
Total Cost	€

(b) Jackie wanted to buy a new MP3 player.

She had two different memory sizes to pick from.
She had four different colours to pick from.

These are shown in the tables below.

Memory Size
16 GB
32 GB

Colour
White
Black
Pink
Blue

Complete the table below to show all of the eight possible MP3 players that Jackie could buy.

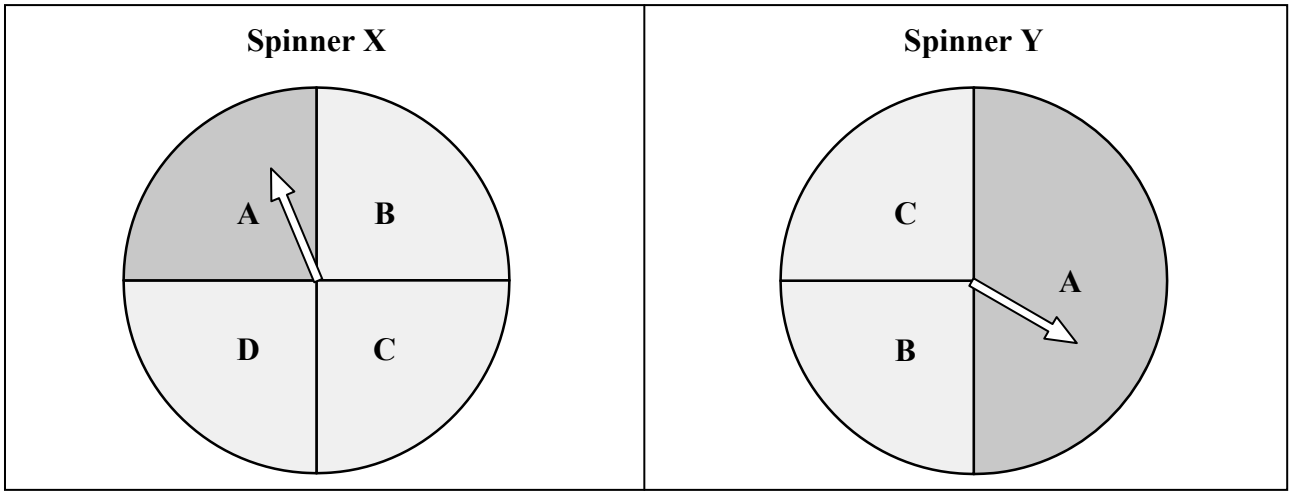
	Memory Size	Colour
1	**16 GB**	**White**
2	**16 GB**	**Black**
3		
4		
5		
6		
7		
8		

(c) Jackie decided to buy a blue MP3 player with a memory size of 32GB. The price was £140.
The exchange rate was £1 = €1·17. Find the cost of the MP3 player, in euro (€).

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

Áine and Mark are playing a board game with a spinner.

They can play using either **Spinner X** or **Spinner Y**, as shown.



To win the game, they must spin the arrow and have it stop on the sector marked **A**.

(a) Which spinner should Áine choose in order to have the best chance of winning?
Explain your answer.

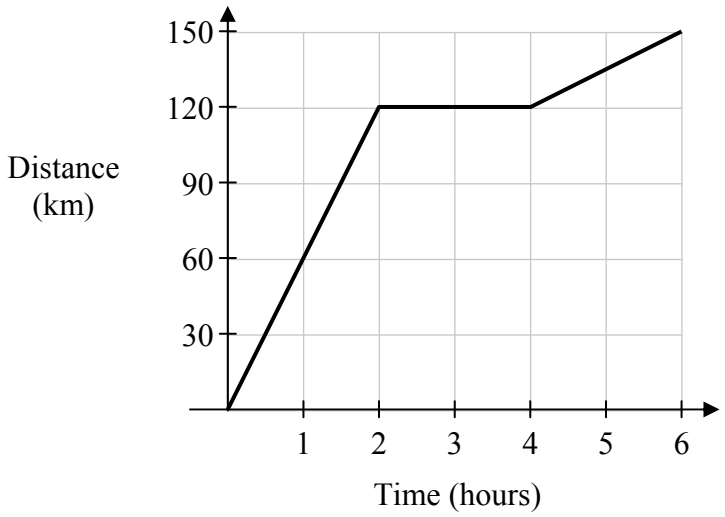
Spinner Áine should use:

Explanation:

(b) Mark plays the game 12 times using **Spinner Y**.
Out of his 12 games, how many should he expect to win?

Question 6 **(Suggested maximum time: 5 minutes)**

The diagram below shows the distance travelled by a car on a certain journey.



One of the stories below matches the graph. Put a tick (✓) in the box matching the correct story.
(Note: Only **one** story matches the graph.)

Story	Tick one story
A car travels 120 km in 2 hours. It stops for 2 hours. It then travels another 150 km in 2 hours.	
A car travels 120 km in 1 hour. It stops for 1 hour. It then travels another 30 km in 1 hour.	
A car travels 120 km in 2 hours. It stops for 2 hours. It then travels another 30 km in 2 hours.	

Question 7 **(Suggested maximum time: 15 minutes)**

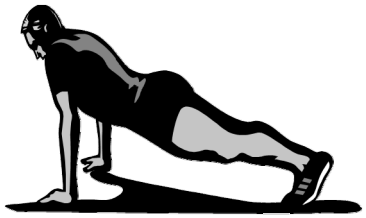
During a PE class, the number of push-ups completed by twelve students was recorded.
The results are as follows.

32	28	68	22	17	12
39	33	16	25	15	28

(i) Fill in the stem-and-leaf plot to show the number of push-ups completed by the students.

1	
2	
3	
4	
5	
6	

Key: $1|2 = 12$ push-ups



(ii) What was the **least** number of push-ups completed by a student?

(iii) Find the **range** of the data.

(iv) Calculate the **mean** number of push-ups completed.

(v) One student does a lot of physical training. Write down the number of push-ups completed by this student. Give a reason for your answer.

Number of push-ups:

Reason:

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Question 8 **(Suggested maximum time: 10 minutes)**

Kate needed a taxi to take her from her house to the airport. HI-HO taxis was the cheapest.

HI-HO taxis had a flat charge of €3, and a further charge of €2 for each km travelled.

(i) Complete the following table to show the cost of the taxi.

Number of km travelled	Cost (€)
0	**3**
1	**5**
2	
3	
4	
5	
6	
7	
8	
9	

(ii) Kate travelled a distance of 7 km in the taxi. How much was she charged for this trip?

(iii) When Kate arrived at the airport she paid the taxi driver with a €20 note.
She told the taxi driver to "keep the change".

How much change did the taxi driver keep?

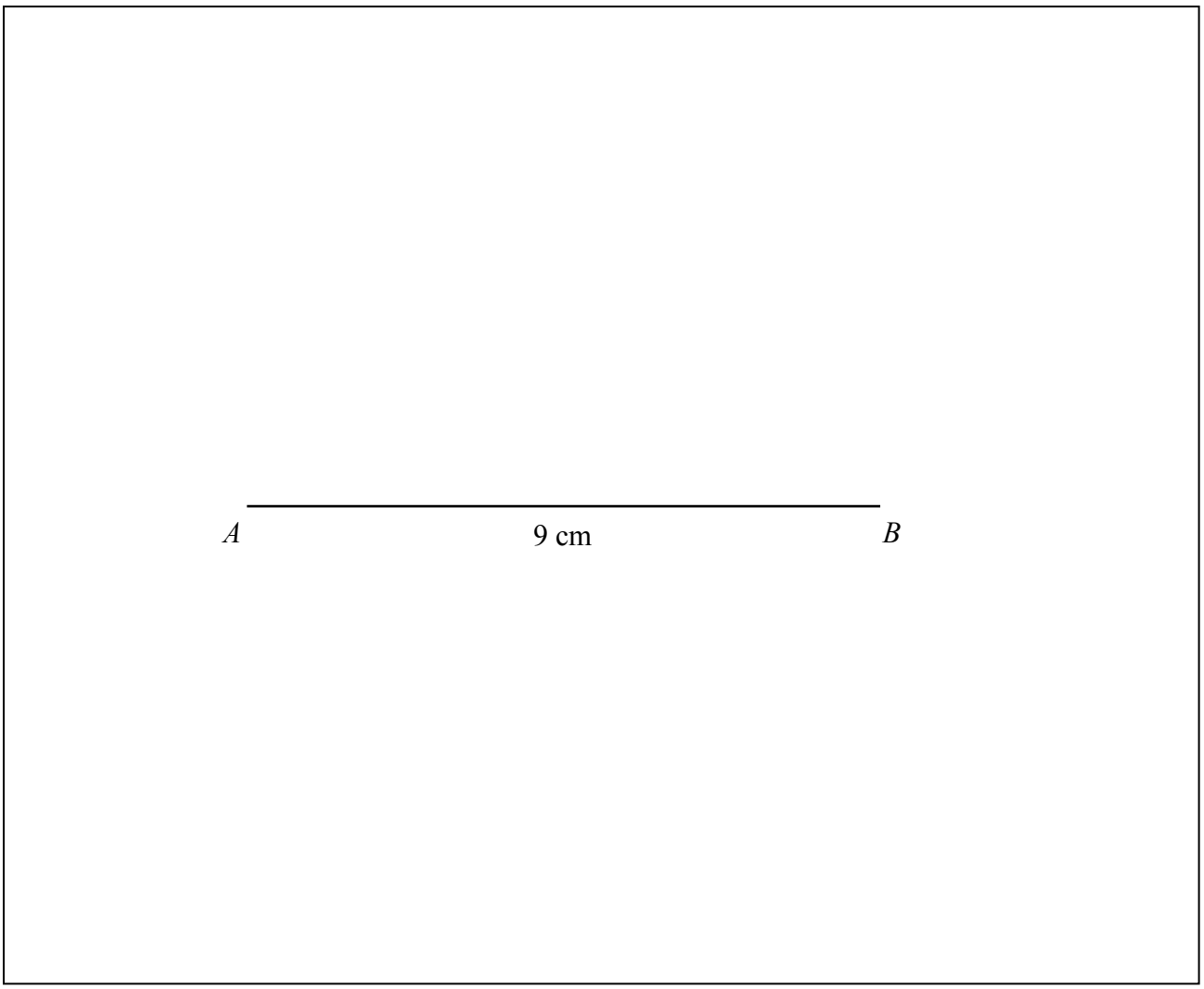
Question 9 **(Suggested maximum time: 10 minutes)**

(i) Construct the triangle ABC, where:

$|AB| = 9$ cm

$|BC| = 5$ cm

$|\angle ABC| = 60°$.



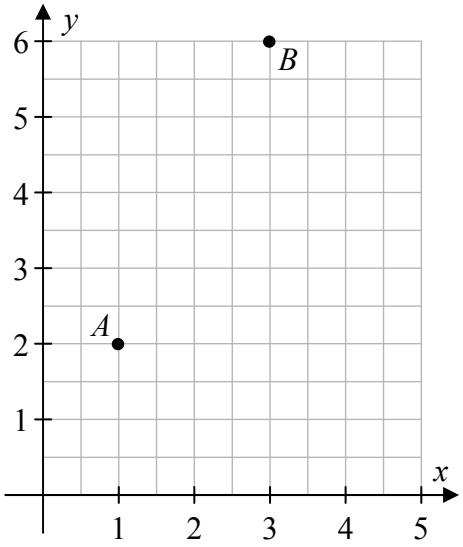
(ii) Measure $|AC|$. $|AC| =$ ☐

(iii) What type of triangle have you constructed in **(i)** above?
Put a tick (✓) in the correct box below.

Equilateral	Isosceles	Scalene
❒	❒	❒

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

The points A and B are shown on the co-ordinate diagram below.



$A = (\quad , \quad)$

$B = (\quad , \quad)$

(i) Write down the co-ordinates of A and B.

(ii) Join A to B using a ruler.

(iii) Find the slope of the line AB.

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

(a) Evaluate $4x + 6y$, when $x = 3$ and $y = 5$.

(b) Solve $3x + 2 = 17$.

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

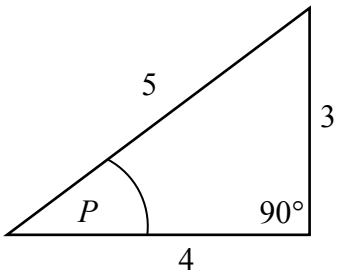
(a) Simplify $2(3x - 4y + 6)$.

(b) Factorise $3x^2 + 4x$.

$3x^2 + 4x = x$ ( )

Question 13 **(Suggested maximum time: 5 minutes)**

The diagram below shows a right-angled triangle with sides of length 3 cm, 4 cm, and 5 cm.
The angle P is marked.



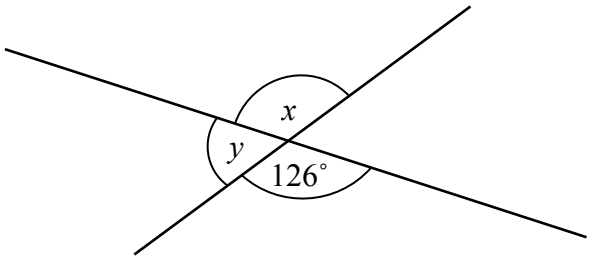
(i) What is the length of the **hypotenuse**? Hypotenuse = ☐

(ii) What is the length of the side **adjacent** to the angle P? Adjacent = ☐

(iii) Write down $\cos P$ as a fraction. $\cos P$ = ☐/☐

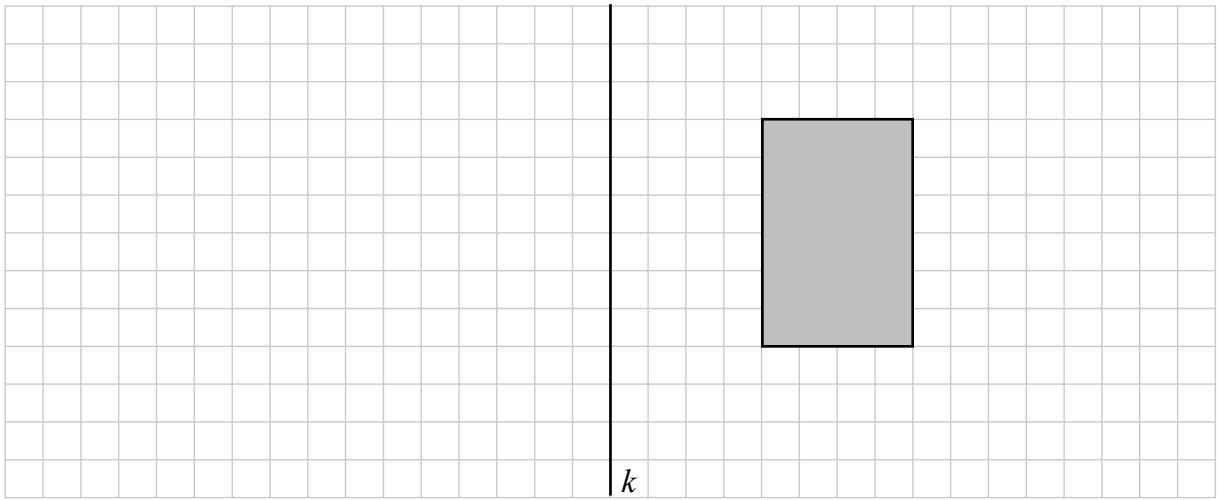
Question 14 **(Suggested maximum time: 10 minutes)**

(a) Find the value of x and the value of y in the following diagram.



$x =$ $y =$

(b) **(i)** Draw the image of the shaded rectangle below, under axial symmetry in the line k.



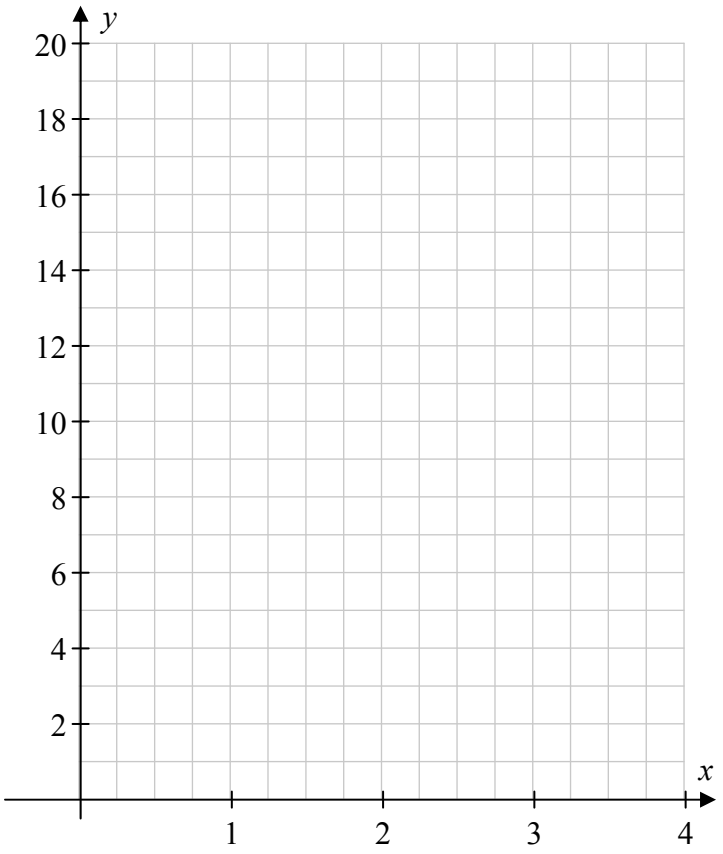
(ii) Find the **perimeter** of the shaded rectangle in **(b)(i)**.
Give your answer in centimetres.

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

(i) If $y = 4x + 1$, fill in the table below.

x	1	2	3	4
y			**13**	

(ii) Using your answers from **(i)**, draw the graph of $y = 4x + 1$ from $x = 1$ to $x = 4$, where $x \in \mathbb{R}$.



(iii) Use your graph to find the value of y when $x = 2 \cdot 5$.

Show your working out on the diagram, and write your answer below.

$y =$ ☐

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