Classroom-based Assessments

Classroom-based assessments (CBAs) are mini-projects that you will complete in class with your teacher in Second and Third Year. CBAs give you a chance to enjoy and learn more about maths. They will also help to develop your problem-solving and communications skills. There are two CBAs for Maths:

CBA 1: Mathematical Investigation	This CBA is completed in Second Year. It focuses on **problem-solving**. You will be expected to define a problem, break it into smaller parts, and use maths to explain and solve the problem. At the end of the investigation, you should look back at the problem and interpret your findings.
CBA 2: Statistical Investigation	This CBA is completed in Third Year. It focuses on **statistical inquiry**. You will be expected to gather, analyse and interpret data to answer a statistical question.

In Third Year, after you complete CBA 2, you will complete the **Assessment Task**. This is worth 10% of the final Junior Cycle Maths examination. The questions in the Assessment Task ask you to reflect on the skills you developed during CBA 2.

CBA 1: Mathematical Investigation

CBA 1 is a project that you will complete over a three-week period in Second Year. Your teacher will give you feedback to help you to complete it successfully.

There are four stages you should follow to complete CBA 1 successfully.

Stage 1: Define the problem statement

A problem statement describes the problem that needs to be solved. It can be a maths problem, a problem from another subject, or a topic you are interested in outside of school. Once you decide on the problem you want to investigate, you will need to define it. So you will need to think about the key pieces of information that you need to put together to find the solution. A problem statement should be:

- Clear and concise
- Relevant to the real world
- Broad enough to allow you to think critically and apply problem-solving skills

Examples

Here are some examples of problem statements:

1. Post-Brexit, is it sustainable and cost-effective to import cars from the UK to Ireland?
2. If I kick two balls with different volumes, which one will go farther and higher?

Stage 2: Translate the problem to mathematics

Once you have decided on the problem you want to solve, you then need to come up with a plan for finding the solution.

- Use what you already know in maths or other subjects to come up with your plan.
- Think about what you need to do to solve the problem and how to find the answer.
- You can simplify the problem further by making some assumptions.
- Think carefully about the situation you are investigating. Identify what's important, and then explain it using mathematical language.

Examples

Here are some examples of assumptions that could be made about the problem statements on the previous page:

1. Currency exchange rates will not change. Cars used to compare costs will be the exact same models.
2. Weather conditions when kicking the two balls will be the same. Video of kicks will be of high enough quality to accurately estimate the height of each ball.

CBA 2: Statistical Investigation

CBA 2 is the Statistical Investigation. For CBA 2, you have to carry out an investigation of changing data. This can relate to work you have done studying maths or other subjects in school. It might also be from another real-world area that you are interested in and that involves data. This CBA involves using skills like asking questions, working with others, gathering data, analysing and interpreting the data, and communicating your findings.

There are four stages to follow to complete CBA 2 successfully.

Stage 1: Design the investigation

Once you have decided on a topic that interests you, you can design the question you want to ask. A statistical question is a type of question that can be answered by collecting and analysing data. Unlike factual questions that have one definite answer, a statistical question involves a range of possible answers. These questions often focus on gathering information about a group or population and using this information to make future predictions.

Next in your design, you need to decide on which method you are going to use to collect the data.

It is important that you avoid bias in your question and in the way that you gather data. For more information on bias, see Chapters 18 and 19 (Statistics I and II).

Examples

Here are some examples of statistical questions:

1. What are the differences in earnings between rugby and soccer players?
2. What is the average distance run by footballers/rugby players during matches?
3. Which musical genres do your family members/classmates prefer on Spotify Wrapped? How long do they spend listening?
4. What is the range of revenue for the top 10 football teams in the Premier League? How much revenue do clubs generate from different sources?

Stage 2: Identify the variables of interest

After you have decided on a question you want to answer, you next need to decide on appropriate variables. This could be age, height, distance or time (e.g. hours spent playing football).

Examples

Here are some variables of interest for the statistical questions above:

1. Number of games played/average earnings
2. Length of pitch/time played
3. Number of songs/listening time/genres, etc.
4. Payments received for match receipts, sponsorship deals and player transfers

Exam Preparation

Question 1

Chapters 1, 2, 3, 4, 7, 8

(a) Find the value of each of the following:

(i) 470 + 782 (ii) 3·4 × 5 (iii) 32 ÷ (7 − 3) (iv) 2^5

(b) (i) Write the numbers **2**, **3** and **4** into the three empty boxes below to make the mathematical statement true. Use each number only once.

$$\frac{\square}{\square} + \frac{\square}{7} = \frac{29}{28}$$

(ii) Write the numbers **2**, **4**, **6** and **7** into the boxes below to make the largest possible rational number.

$$\frac{\square}{\square} + \frac{\square}{\square}$$

(iii) Conor and Cillian buy a pizza that costs €16·44. Conor eats five slices of the pizza and Cillian eats the remaining seven slices. They agree to split the cost in the ratio of 5:7. What is Cillian's share of the cost?

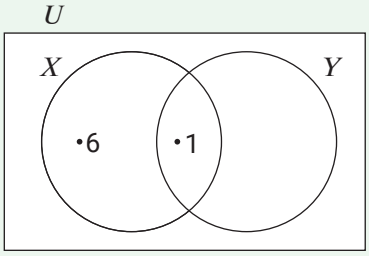
(c) The sets U, X and Y are defined as follows:

U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

X = {Factors of 12}

Y = {Factors of 8}

(i) Use these sets to complete the Venn diagram below:



(ii) Use your Venn diagram to find the highest common factor of 8 and 12.

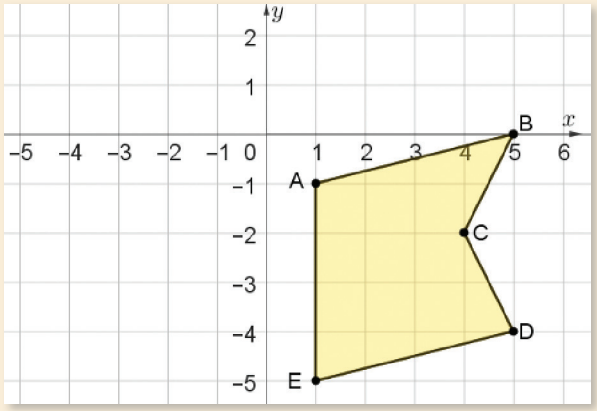
(iii) Put a tick (✓) in the correct box in each row of the table below, to show whether each statement is true or false.

Statement	Tick **one** only for each statement	
	True	**False**
$\#Y = 3$		
$X \cup Y = \varnothing$		
$X \cap Y = Y \cap X$		
$X \setminus Y = Y \setminus X$		

Question 2

Chapters 6, 10, 11, 12

(a) The pentagon $ABCDE$ is shown in the co-ordinate diagram below.



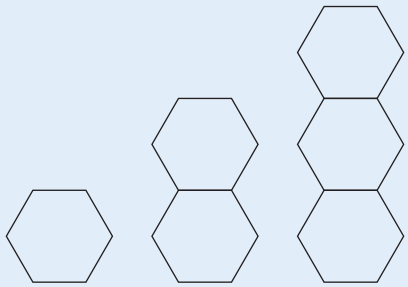
(i) Complete the table to show the co-ordinates of the five corners of $ABCDE$.

Point	A	B	C	D	E
Co-ordinates	(1, −1)	(5, 0)			

(ii) Copy the diagram above and draw the image of $ABCDE$ uder **axial symmetry** in the ***y*-axis**.

(iii) On your diagram from part (ii), construct the **perpendicular bisector** of $[ED]$.

(b) Saoirse uses sticks to make a sequence of patterns.
The first three patterns in her sequence are shown below.



Pattern 1 **Pattern 2** **Pattern 3**

(i) Draw Pattern 4 in the sequence.

(ii) Complete the table below to show the number of sticks and the number of hexagons in each of the first five patterns.

Pattern	1	2	3	4	5
Number of sticks		11			
Number of hexagons		2			

(iii) Saoirse says that the sticks pattern is **non-linear**. Is Saoirse correct? Give a reason for your answer.

(iv) One pattern has exactly **36** sticks.
Tick (✓) the correct box to show which pattern this is. Show your workings.

Pattern 5	**Pattern 7**	**Pattern 10**
☐	☐	☐