Full name: _____

Teacher: _____

Due date: _____

YEAR 8 MATHEMATICS

Assignment

Term 3

2023

Outcomes Assessed		
• **MA4-1WM** communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols • **MA4-2WM** applies appropriate mathematical techniques to solve problems • **MA4-3WM** recognises and explains mathematical relationships using reasoning		
Content Assessed		
Refer to the attached assignment booklet and instructions. Each student is to complete tasks of their choosing.		
Weighting	**15%**	**Due:** This assignment is due to your classroom teacher two weeks from the date received (due in Week 7).
Penalties as per assessment booklet – Failure to submit the assignment within the negotiated time frame may result in N-award in Mathematics.		

Gardner's Multiple Intelligences and Revised Blooms Taxonomy

This assignment has been designed to give all students an opportunity to best demonstrate their ability in Mathematics. Students can choose from tasks aligned to the different categories of Gardner's Multiple Intelligences. The tasks are also aligned to the Revised Bloom's Taxonomy - a multi-tiered model of classifying thinking according to six cognitive levels of complexity.
Thus, students can choose tasks according to their preferred modes of learning, or try different styles of learning. Students are also able to revise and explore key concepts of this unit by completing lower-order tasks and then challenge themselves to develop their understanding and skills by completing higher-order tasks.

Instructions

This assignment has two sections:

Section 1

- Answer all questions to the best of your ability in the space provided.
- Show all working.

Section 2

- Select one of the problems and complete in the space provided.
- Each question is worth 2 marks.

Marking

Marks are awarded based on the difficulty and amount of work required to complete each task.

Mark = _____/30

Section 1

Complete the following to the best of your ability.

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1) **Terminology**
Fill in the blanks. All terminology used below relates to the Algebra Unit.

(1 mark)

a) L _ _ e t _ r m _

b) _ x p _ _ d i _ g

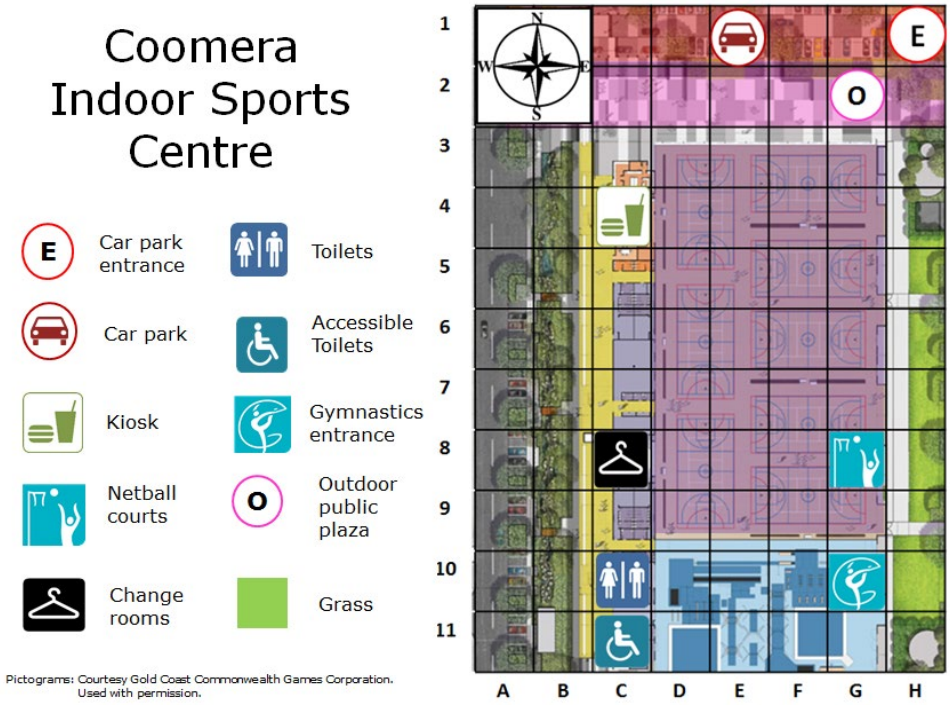
c) S _ _ s t _ t _ _ e

d) _ l g _ _ r a _ c t e _ h _ l _ _ e s

e) F _ _ t _ r _

f) E x _ _ e s s _ _ n

2) **Grid Reference**



Where will you be if you are at the following grid references in the table below? Add the answers to the table.

(2 marks)

Grid reference	Location
(H, 1)	
(G, 8)	
(C, 4)	
(G, 2)	

3) **Sector Graph (3 marks)**

20 friends are trying to find the most popular take away food. They each get to submit one choice.

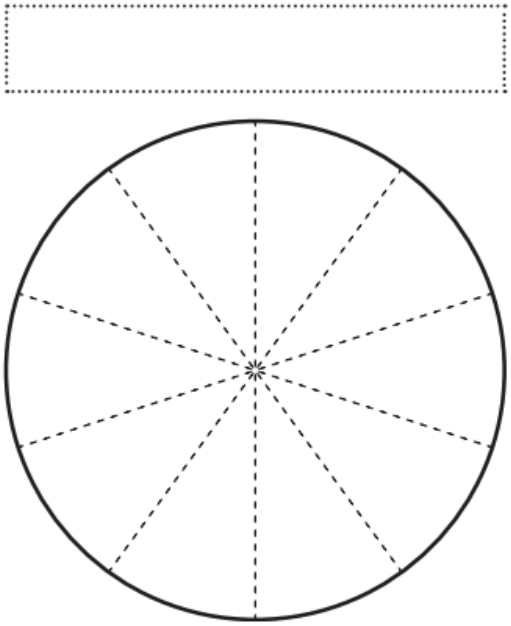
a) Find the missing values in the table below.

(1 mark)

Take Away Food	
KFC	12
Pizza	
McDonalds	3
Total	

b) Complete the sector graph to display this data.

(1 mark)



4) Worldwide Measurement

Write a short paragraph explaining why it is essential that we use the same measurement system worldwide. Make reference to our current measurement system and its advantages over previous measurement systems. Give at least three examples to support your argument.

(2 marks)

5) **Rounding Decimals**

Rounding numbers correctly is important! For example, in 1987 government in the UK underestimated inflation by 0.1%. This caused them to have to pay out an extra 100 million pounds (180.6 Australian Dollars) on things such as pensions.

Correctly round these numbers to the decimal places specified in the brackets.

(2 marks)

a) 1.432 (1 decimal place)

b) 78.45767 (2 decimal places)

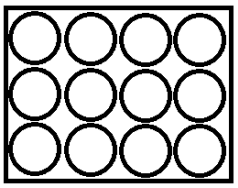
c) 0.0125 (3 decimal places)

d) 39.9636 (1 decimal place)

6) **Packaging Problem**

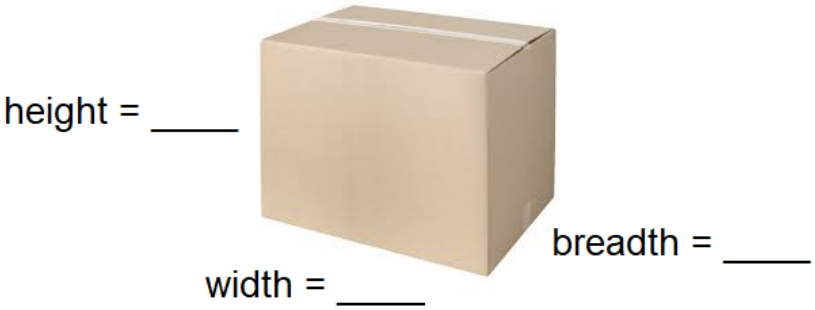
The dog food sold at the supermarket comes in a cylindrical tin with a height of 12 cm and a radius of 4 cm.

In order to be easily transported from the Sydney distribution point to the Orange supermarket, the dog tins must be packaged inside a cardboard box. Each cardboard box can contain 2 rows of 12 tins in the layout shown below. Each tin is stacked with sides touching.



Calculate the dimensions (width, breadth and height) of the cardboard box. Show all necessary working.

(3 marks)



7) Footy Fan

The data below shows the number of tackles each player made during a single game.

Cronulla Sharks

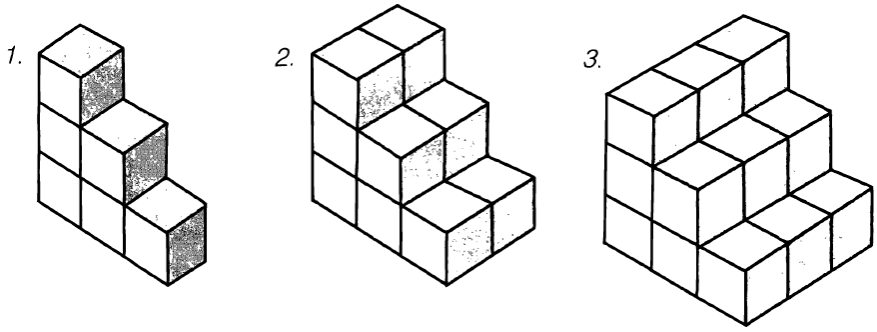
6	17	25	33	33	36	39	40	44	48	49	50	51	53	55	60

Display this data using a stem-and-leaf plot.

(2 marks)

8) **How many cubes?**

Use the diagram below to help you answer the questions.



a) Complete the table below for the surface area of each tower.

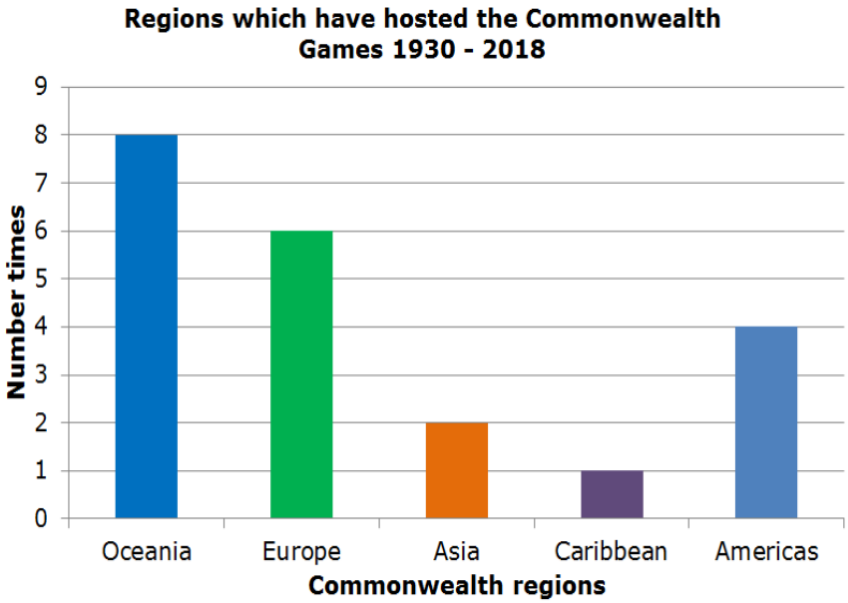
(1 mark)

	Tower 1	**Tower 2**	**Tower 3**
Surface Area			

b) In words or algebraically, explain/write a rule that would help you calculate the surface area of the 10^{th} tower.

(1 mark)

9) **Host Regions**



a) Which region has hosted the Commonwealth Games the most and which has hosted the least?

(1 mark)

b) Provide possible reasons why these regions have hosted the most and the least number of Commonwealth Games.

(1 mark)

10) **Formulae Poster**

Design an A4 summary sheet with useful measurement formulae to be displayed in class. Make sure to include the following:

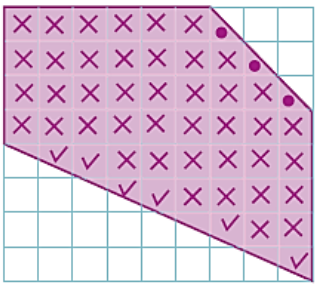
- Pythagoras' Theorem (finding the hypotenuse)
- Pythagoras' Theorem (finding the short side)
- Area of Squares, Rectangles and Triangles
- Area of Special Quadrilaterals (Kite/Rhombus, Parallelogram, Trapezium)

(4 marks)

Please complete in space provided on next page.

Formulae Poster

11) **Counting Area?**



To estimate the area by counting squares:

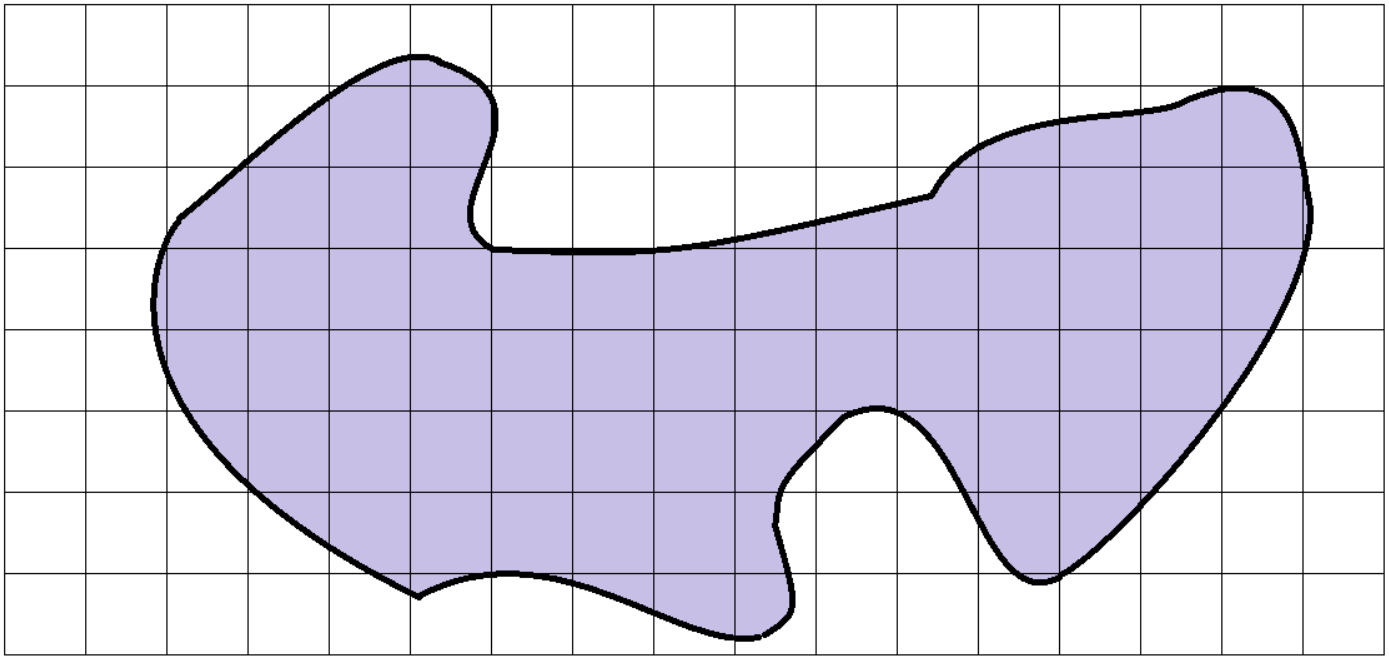
- count whole squares as 1 square unit
- count squares with more than half shaded as 1 square unit
- count squares with exactly half shaded as $\frac{1}{2}$ square unit
- do not count squares with less than half shaded.

There are 42 complete squares.	42	(×)
There are 6 with more than half shaded.	+ 6	(✓)
There are 3 with exactly half shaded.	$+ 1\frac{1}{2}$	(•)
	$49\frac{1}{2}$	

$\therefore$ Area $\approx 42 + 6 + 1\frac{1}{2} = 49\frac{1}{2}$ square units.

Using the strategy outlined above, determine the area of the shape below.

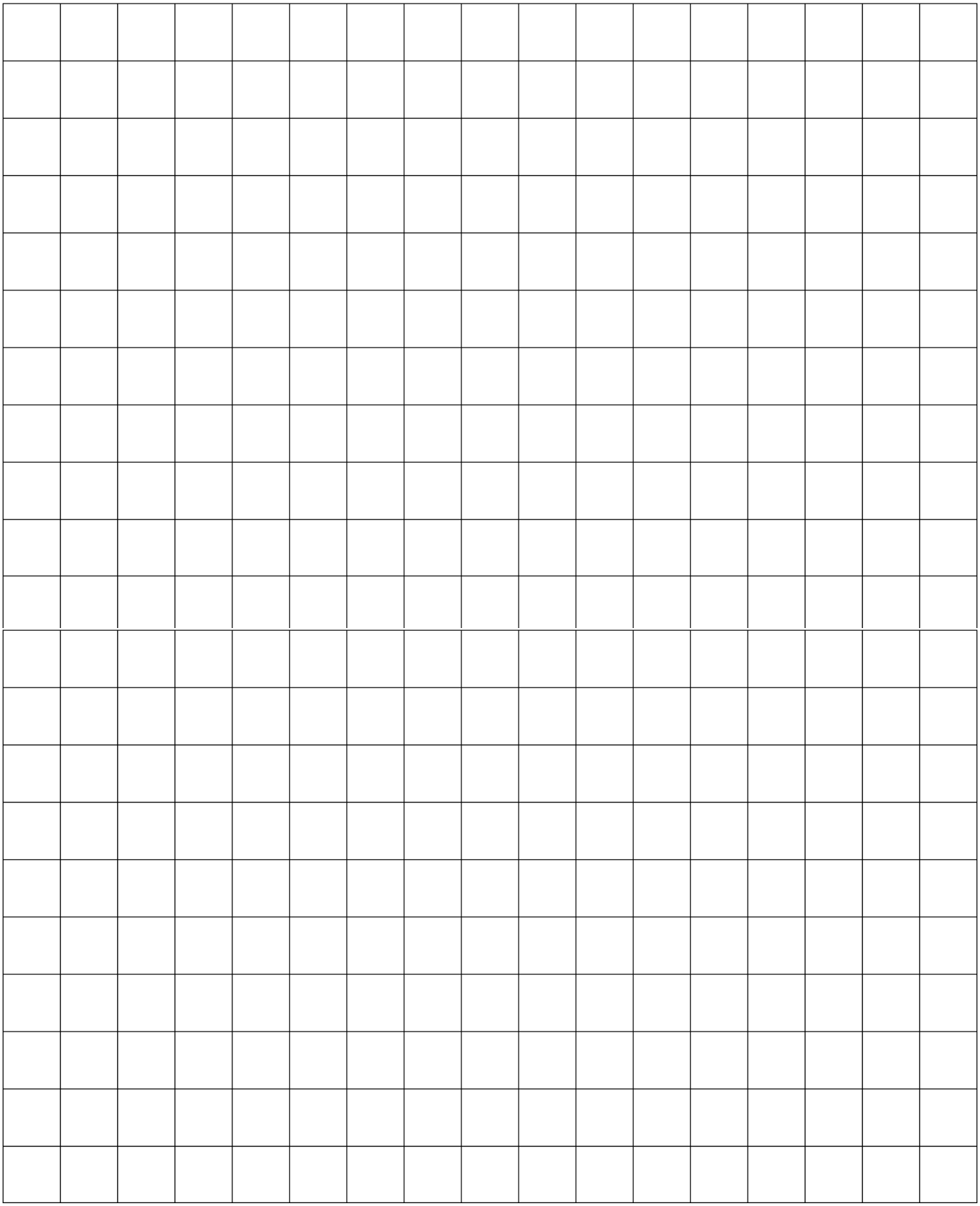
(1 mark)



12) **Counting Area… Again**

You are going to use the strategy explained in question 19 (previous page) to estimate the area of your hand in the grid below.

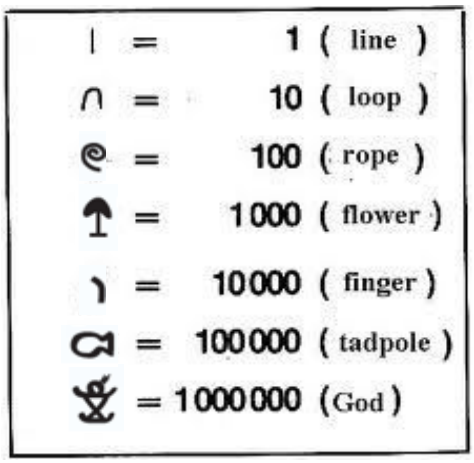
(2 marks)



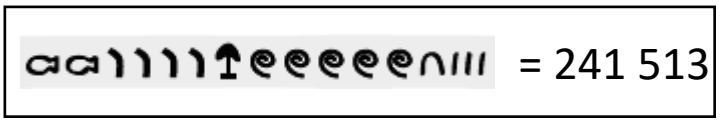
13) **Exploring Number Systems**

All ancient civilizations developed methods to count and use numbers.

The ancient Egyptians are one of the oldest known civilizations to have a recorded number system. About 5000 years ago, the Egyptians used hieroglyphics. The hieroglyphs used for numbers are shown below.



Example: The example below shows how the symbols are used to represent numbers. As the numbers get larger in value, the symbols are simply repeated. This set of symbols represents 241 513.



You are to research the Babylonian number system and write a paragraph addressing the following points.

- an approximate year that the number system was first used
- three key characteristics of the number system
- one way in which the chosen system differs from our base-10 (hindu-Arabic) number system.

(3 marks)

Section 2

Now you choose!

Select <u>one</u> of the following activities worth 2 marks and complete to the best of your ability.

Pi Recital

Pi (π) is a very special number which relates the circumference (perimeter) of a circle to its diameter or radius. It is a never-ending number that has been recited up to a whopping 67 890 digits.
One way to remember the digits is to come up with a phrase or sentence where the number of letters in each word equates to the order of the digits in pi. See the examples below:

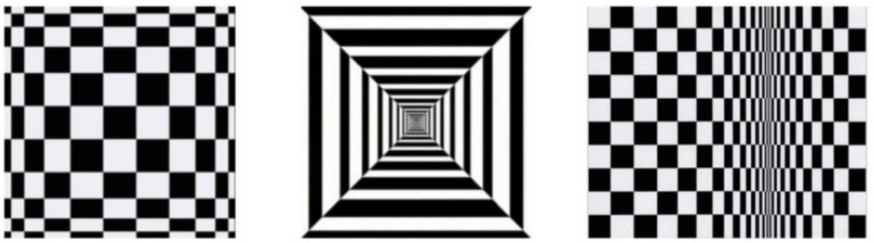
"How I wish I could calculate pi" OR "May I have a large container of coffee?"
3 . 1 4 1 5 9 2 3 . 1 4 1 5 9 2 6

You are to come up with your own phrase such that the number of letters in each word represents the order of the digits of pi. Aim for a phrase of at least 10 digits.

(2 marks)

Optical Illusion (2 marks)

This task combines art, Mathematics and design. Optical illusions are geometric shapes and patterns, often coloured in black or white. Looking at the three examples below:



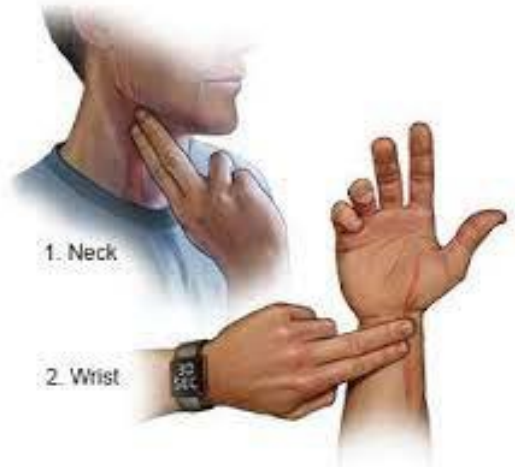
Create your own optical illusion on the grid provided below. Write clear instructions on how you created your optical illusion. **(2 marks)**

Instructions:

To the heart beat!

Your heart rate can be measured by simply finding a pulse and counting the number of times your heart beats in a single minute.

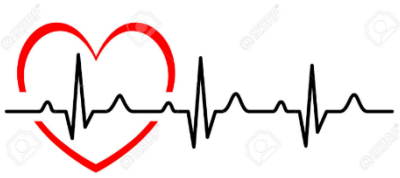
A pulse can be found by placing two fingers (not a thumb) onto the neck just below the chin, or onto the inside of the wrist as shown below.



Using this method, calculate your heart rate.

(1 mark)

Heart rate = _____ beats per minute.



If you haven't been completing any physical activity, this is called your **resting heart rate.**

Now, using your heart rate, you can calculate how many times your heart would beat in a year if it were to maintain this resting heart rate.

(1 mark)

HINT: 1 year = 365 days
1 day = 24 hours
1 hours = 60 minutes

Number of heart beats in a year = _____

Pool Problem

A new rectangular pool which is 6m in length and 4m in breadth is to have a single-width paved path installed around its perimeter. Each paver is 0.5m long and 0.5m wide.

Draw a diagram to show the pool, including the new path. Label all dimensions.

(2 marks)

Evaluation Tools

Create a quiz using technology (e.g. Quizlet, Kahoot!, Jeopardy, Quizizz). The quiz must be your own and have a minimum 10 of mathematical questions. It should ask questions regarding topics we have covered this year, be challenging and have the correct solutions present.
Screenshots are to be stapled to the back of this assignment.

(2 marks)

End of Assignment! 😊