



Full name: _____

Teacher: _____

Due date: _____

YEAR 7 MATHEMATICS

Assignment

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 2 weeks from the date received (due in Week 7).

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

You do not have to answer all the questions!

Each box in the Task Grid (on the next page) is a task.

1. You must complete a total of **20 marks**.
2. Some tasks will require you to write your answers on separate A4 paper that you will need to provide. Please clearly write your full name and the task number.
3. Please highlight on the Task Grid which tasks you are completing.

Marking

Marks are awarded based on the difficulty and amount of work required to complete each task. Marking guidelines are provided under each task description.

Task Grid

Multiple Intelligences	Bloom's Taxonomy: Six Thinking Levels					
	Knowing	Understanding	Applying	Analysing	Creating	Evaluating
Verbal/Linguistic I enjoy reading, writing & speaking	1) Synonyms (2 marks)	2) Supporters (2 marks)	3) What's on the back? (2 marks)	4) Consecutive Numbers (2 marks)	5) The Number 2 (3 marks)	6) Digit Detector (2 marks)
Logical/Mathematical I enjoy working with numbers & science	7) Records (1 mark)	8) Fastest Time (2 marks)	9) Dizzy Digits (3 marks)	10) Distance (2 marks)	11) The Largest Number (2 marks)	12) So Many Sums (4 marks)
Visual/Spatial I enjoy painting, drawing & visualising	13) The Australian Medal Tally (3 marks)	14) Balloon Bursting (2 marks)	15) Where should the numbers go? (2 marks)	16) Multiplication Table (3 marks)	17) Addition Pyramid (4 marks)	18) It all adds up to nothing (3 marks)
Bodily/Kinaesthetic I enjoy doing hands-on activities, sports & dance	19) Counting Cars (2 marks)	20) Not 3 in a Line (3 marks)	21) Heads over Tails (3 marks)	22) Flexangles (2 marks)	23) Paper Planes (3 marks)	24) Faming (3 marks)
Technology I enjoy using computers	25) Spreadsheet (2 marks)	26) Difference (3 marks)	27) Angles in Real Life (3 marks)	28) New York (3 marks)	29) PowerPoint (3 marks)	30) Comparing Number Systems (5 marks)

Task Details

Verbal/Linguistic

1) Synonyms (2 marks)

List 3 synonyms for each of the following words: addition, subtraction, multiplication and division

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Marking	
1/2 mark	For each correct group of 3 synonyms for each term

2) Supporters (2 marks)

A crowd of 29 641 attended a NRL match between the Bulldogs and the Dragons. If 17 492 people supported the Bulldogs and the rest supported the Dragons, how many supporters did the Dragons have? Show all working out.

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Marking	
2 marks	Correct solution with all working shown
1 mark	Correct solution with no working

3) What's on the back? (2 marks)

Four cards each have a number written on one side and a property written on the other.

The four numbers are 2, 5, 7 and 12.

The four properties are:

- Divisible by 7
- Odd
- Prime
- Greater than 10

On each card, the number written does not have the property that is written on the other side. What are the four number-property pairs?

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Marking	
1/2 mark	For each correct pairing

4) Consecutive Numbers (2 marks)

The difference of the squares of two consecutive odd numbers is 32. What are the two odd numbers?
Show all working.

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Marking	
2 marks	Correct solution and working
1 mark	Working out demonstrates an understanding of squares, odd numbers and consecutive numbers.

5) The Number 2 (3 marks)

Write a 300 word story about the adventures of the number 2. Your story must include the concepts of addition, subtraction, multiplication and division.

Your story should be imaginative, it can be written in the space below or can be typed and printed.

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Marking	
3 marks	Detailed and original story that meets the word limit and includes the concepts of addition, subtraction, multiplication and division
2 marks	Some concepts are included and meets the word limit.
1 mark	Story does not meet the required word limit and include some concepts.

6) Digit detector (2 marks)

What number am I?

1. I am a 3 digit number
2. I am an odd number
3. I am divisible by 5
4. Each of my digits is different
5. My digits add up to 8
6. The tens digit is smaller than the hundred digit
7. I am less than 300
8. I have only one even digit

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Marking	
2 mark	Correct number that meets all requirements
1 mark	Number contains 1 or 2 minor errors

Logical/Mathematical

The table below shows the Commonwealth Records for the Men's athletics events. Use the table to answer Questions 7 and 8

Event	Record	Name	Nation	Year
100 m	9.88	Ato Boldon	 Trinidad and Tobago	1998
200 m	19.80	Jereem Richards	 Trinidad and Tobago	2022
400 m	44.24	Kirani James	 Grenada	2014
800 m	1:43.22	Steve Cram	 England	1986
1500 m	3:30.12	Oliver Hoare	 Australia	2022
5000 m	12:56.41	Joshua Cheptegei	 Uganda	2018
10000 m	27:09.19	Jacob Kiplimo	 Uganda	2022
Marathon	2:09:12	Ian Thompson	 England	1974
110 m hurdles	13.08	Colin Jackson	 Wales	1990
	13.08	Colin Jackson	 Wales	1994
	13.08	Rasheed Broadbell	 Jamaica	2022
400 m hurdles	48.05	Louis van Zyl	 South Africa	2006
3000 m steeplechase	8:10.08	Conseslus Kipruto	 Kenya	2018
High jump	2.36 m	Clarence Saunders	 Bermuda	1990
Pole vault	5.80 m	Steven Hooker	 Australia	2006
Long jump	8.41 m (+0.6 m/s)	Luvo Manyonga	 South Africa	2018
Triple jump	17.86 m	Jonathan Edwards	 England	2002
Shot put	22.45 m	Tomas Walsh	 New Zealand	2018
Discus throw	68.20 m	Fedrick Dacres	 Jamaica	2018
Hammer throw	80.26 m	Nick Miller	 England	2018
Javelin throw	90.18m	Arshad Nadeem	 Pakistan	2022
Decathlon	8663 pts	Daley Thompson	 England	1986
20 km walk	1:19:34	Dane Bird-Smith	 Australia	2018
50 km walk	3:42:53	Nathan Deakes	 Australia	2006
4 × 100 m relay	37.58	Usain Bolt Kemar Bailey-Cole Nickel Ashmeade Jason Livermore	 Jamaica	2014
4 × 400 m relay	2:59.03	Michael McDonald Roxbert Martin Gregory Haughton Davian Clarke	 Jamaica	1998

7) Records (1 mark)

List the events that have records from the 2018 Commonwealth Games

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Marking	
1 mark	Correctly identified events

8) Fastest Time (2 marks)

If the 400m record holder ran the 100m event, how long would you expect it to take him? How does this time compare with the record of 9.88 seconds?

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Marking	
1 mark	Correct calculation of time with working out
1 mark	Correct statement in comparing the timings

9) Dizzy Digits (3 marks)

Using +, -, x or ÷ complete each of the following:

Marking	
1 mark	For each correct answer

- a) Use only four 4's to make 44
- b) Use only five 5's to make 55
- c) Use only six 6's to make 66

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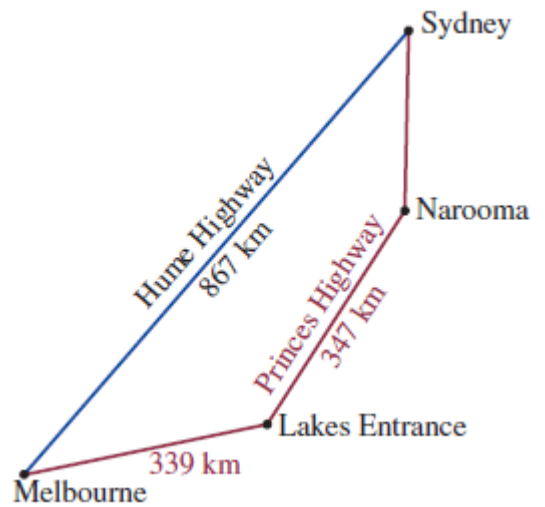
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10) Distance (2 marks)

Lucy and Ty were driving from Melbourne to Sydney for a holiday. The distance via the Hume Highway is 867 kilometres, but they chose the more scenic Princes Highway route even though the distance is 1039 kilometres. They drove to Lakes Entrance the first day (339 kilometres), a further 347 kilometres to Narooma on the second day and arrived in Sydney on the third day.



- a) How much further is Melbourne to Sydney via the Princes Highway than via the Hume Highway? Show working out.

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- b) How far did Lucy and Ty travel on the third day? Show all working out.

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Marking	
1 mark	Part a) Correct solution with working
1 mark	Part b) Correct solution with working

11) The Largest Number (2 marks)

Using the digits 2, 4, 6 and 8 and +, x and =, what is the largest number that can be made? Each number must be used once and you must use both + and x. Show your working.

Note: Powers and brackets are not to be used

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Marking	
2 marks	Correct solution with working

12) So Many Sums (4 marks)

In this addition, each letter stands for a different digit, with S standing for 3

$$\begin{array}{r} \\ + \\ \hline \\ \end{array}$$

Find the value of each letter

What is the value of $Y \times O$?

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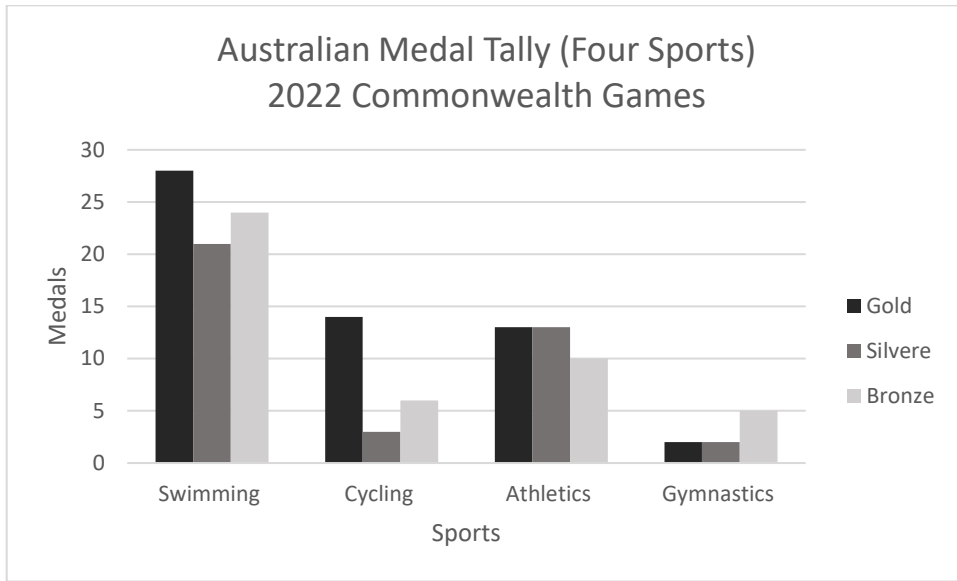
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Marking	
1/2 mark	For each correct value of the letter
1 mark	Correct value of $Y \times O$

Visual/Spatial

13) The Australian Medal Tally (3 marks)



a) 'Sports' is one of the variables shown on the graph. What is the other variable?

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b) What are the top two silver medal winning sports?

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c) In which sport were the most gold medals won?

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d) In which sport were the least number of gold medals won?

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e) Provide two reasons why the swimming team won the most medals.

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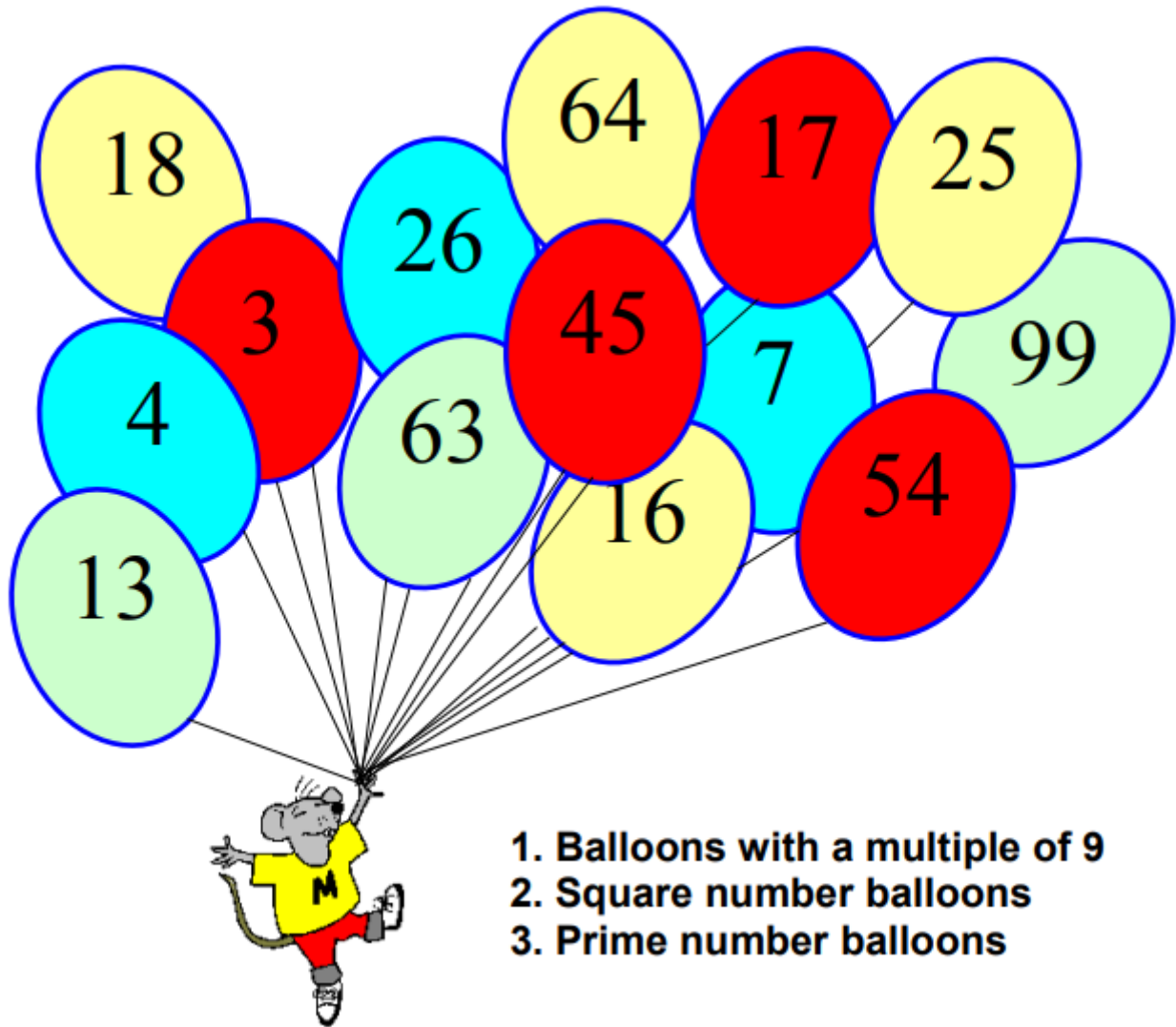
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Marking	
2 marks	Correct responses for a) to d) (1/2 mark each)
1 mark	Correct reasons part e)

14) Balloon Bursting (2 marks)

If a number in one of the balloons is included in the answers to the three problems below then that balloon will fly away. Which balloon is left?



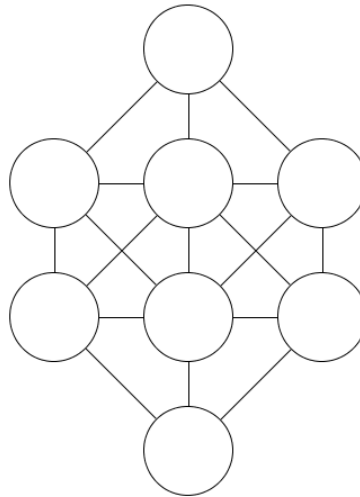
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Marking	
2 marks	Correct solution found

15) Where should the numbers go? (2 marks)

Arrange the numbers 1, 2, 3, 4, 5, 6, 7 and 8 inside these circles so that no two consecutive numbers are in connected circles

Remember: Consecutive means one after the other e.g. 2 and 3



Marking	
2 marks	Correct solution
1 mark	1 mistake present in the solution

16) Multiplication Table (3 marks)

In the multiplication table on the right, the row and column headings are all missing, and only some of the products in the table are filled in.

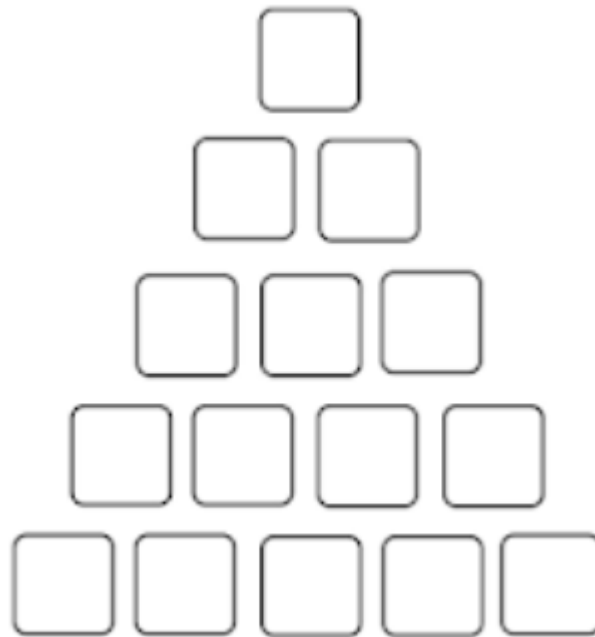
All the numbers in the table are positive integers.

- Complete the table
- What is the value of $A + B + C + D + E$?

x					
	A	10		20	
	15	B	40		
	18		C	60	
		20		D	24
			56		E

Marking	
2 marks	Part a) Table accurately completed
1 mark	Part b) Correct solution

17) Addition Pyramid (4 marks)



1. Write the numbers 1-5 in the bottom row
2. Fill in the rest of the boxes by adding the two numbers below each box
3. Draw another pyramid on a separate piece of paper and try putting 1 – 5 in a different order in the bottom row. Fill in the rest of the boxes. Continue to draw various pyramids until you discover the order that will give you the highest value at the top.

What order will give the highest value at the top? Why?

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Marking	
4 marks	At least two addition pyramids completed with the correct ordering discovered to get the highest value. Answer is justified.
3 marks	At least two addition pyramids completed with the correct ordering discovered for highest value. Answer is not justified.
2 marks	Only two addition pyramids completed, ordering for highest valued not discovered
1 mark	One addition pyramid completed

18) It all adds up to nothing (2 marks)

Using the numbers below create a magic square that all adds up to zero. Note: Each row, column and diagonal must add up to zero

-4	-3	-2	-1	0	1	2	3	4
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Marking	
2 marks	Correct solution developed
1 mark	Solution developed with two or less errors

Bodily/Kinaesthetic

19) Counting Cars (2 marks)

Stand on the pavement of a street and record the colours of 30 cars in the table below.

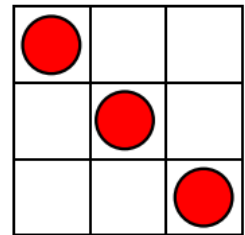
Car Colour	Tally	Frequency (Number)
White		
Black		
Red/Maroon		

<i>Grey/Silver</i>		
<i>Blue</i>		
<i>Green</i>		
<i>Other</i>		

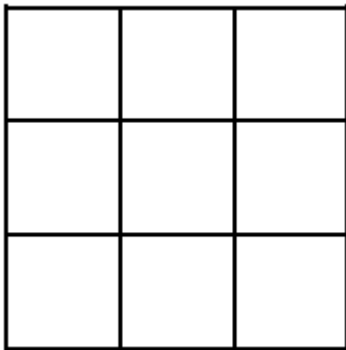
Marking	
2 marks	Table completed with a total of 30 cars
1 mark	Table has not been fully completed or survey did not include 30 cars

20) Not three in a line! (3 marks)

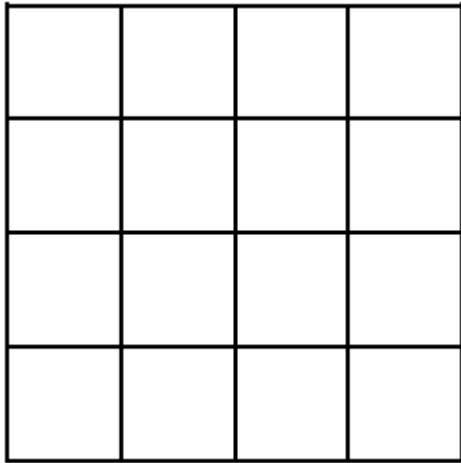
This 3 x 3 square has three counters in it in a row.



- a) How many counters can you place without getting three in a row? Draw their placement in the diagram below. The use of 5 cent coins may assist you.



- b) How many counters can you place in a 4 x 4 square without getting 3 in a row? Draw their placement in the diagram below.



Marking	
1 mark	Part a) Counters have been correctly placed and drawn on the diagram
2 marks	Part b) Counters have been correctly placed and drawn on the diagram

21) Heads over tails (3 marks)

Put four coins on a table, in a row, all tails up, like this:



In order to make a move you must turn over 3 coins

a) How many moves will it take to get all of the coins on heads?

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b) Draw a diagram in the space below or take a picture showing each move and submit this with your assignment

Marking	
1 mark	Part a) Correct number of moves identified
2 marks	Part b) Images showing the required moves submitted
1 mark	Part b) Images showing some moves working towards the correct answer submitted

22) Flexangles (2 marks)

Create the “flexangle” paper shape on the last page of this assignment booklet. Submit this with your assignment

Marking	
2 marks	Shape correctly created

23) Paper Planes (3 marks)

Use the website <http://paperairplanesHQ.com/> to create 2 different paper planes. You must hand in your paper planes with the design name from the website clearly written on it.

Throw each plane 3 times and find the total distance that each plane travelled. Which plane had the best total? Identify the features of the plane that may have aided in its success.

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Marking	
3 marks	2 paper planes submitted with all required calculations and features identified
2 marks	2 paper planes submitted with 1 error in calculations or feature not identified
1 mark	2 paper planes submitted with 2 or more errors in calculations or features identified

24) Farming (3 marks)

A farmer wants to construct two temporary enclosures for some cattle. He has 400 m of portable fencing.

He wants to use all the fencing and to make two paddocks of equal size that share a common fence.

Draw diagrams (in the space below) and clearly show the dimensions of *three* different ways the farmer could construct the paddocks.

State which of your three designs provides the greatest total area for the cattle and justify your decision with calculations

Marking	
3 marks	Three different diagrams constructed with areas calculated. Correct identification of the greatest area.
2 marks	Two different diagrams constructed with areas calculated or three different diagrams constructed with missing areas
1 mark	One diagram constructed with area calculated

Technology

Use the data below for questions 25 and 26

The data shows the maximum and minimum daily temperatures for Thredbo NSW for two weeks in July.

Date	Min Temp (°C)	Max Temp (°C)
Sun 18	-5	4.8
Mon 19	0	4
Tue 20	-8.5	5
Wed 21	-9.5	5.3
Thurs 22	-5	4.9
Fri 23	-1.2	7
Sat 24	-4.5	8
Sun 25	-4	6.8
Mon 26	-6.4	7
Tue 27	-8	8.5
Wed 28	-6	7.5
Thurs 29	-3.5	7.4
Fri 30	1.6	8.5
Sat 31	3	6

25) Spreadsheet (2 marks)

Enter the above data into an Excel spreadsheet. Submit a screen shot.

Marking	
2 marks	Data accurately entered into a spreadsheet
1 mark	Data entered into spreadsheet with some minor errors

26) Difference (3 marks)

In cell D1, enter the label 'Difference'. As shown in the picture below.

	A	B	C	D
		Min Temp (deg C)	Max Temp (deg C)	
1	Date			Difference
2	Sun 18	-5	4.8	9.8
3	Mon 19	0	4	
4	Tue 20	-8.5	5	
5	Wed 21	-9.5	5.3	

To find the difference between the maximum and minimum temperatures for Sunday 18, enter the formula **=C2-B2** in cell D2. Copy this formula into cells D3 to D15. Submit a screen shot of this.

Use this information to answer the questions below

- a) On which day was the largest difference between the maximum and minimum recorded?

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- b) On which day was the smallest difference recorded?

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Marking	
1 mark	Column added with all differences calculated
1 mark	Part a) correctly identified
1 mark	Part b) correctly identified

27) Angles in Real life (3 marks)

1. Find three images from the internet that demonstrate angles in real life. Copy and paste these into a word document to print. Submit this with your assignment. Each image must show a different type of angle.
2. Draw over the image to show an angle
3. Classify the angle and measure its size.

Marking	
3 marks	1 mark for each image with classification and size.

28) New York (3 marks)

Research the average maximum and minimum temperatures for New York for each month of the year. Create a table displaying this information. Submit this with your assignment.

How do the temperatures of New York compare these temperatures with that of your hometown?

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Marking	
3 marks	Table created showing the maximum and minimum temperatures for each month. At least <i>two</i> comparisons made with students home town.
2 marks	Table created showing the maximum and minimum temperatures for each month. One comparisons made with students home town.
1 mark	Table created showing the maximum and minimum temperatures with no comparisons made.

29) PowerPoint (3 marks)

Create a PowerPoint that can be used to teach others one mathematical concept that you have learnt this year. This PowerPoint must be a minimum of 5 slides.

Submit a copy of this PowerPoint with your assignment.

Marking	
3 marks	The PowerPoint is comprehensive and accurately teaches the concept. It contains at least 5 slides.
2 marks	The PowerPoint teaches the concept. Some information may be missing or it is only 4 slides.
1 mark	The PowerPoint is missing important information and is less than 5 slides.

30) Compare Number Systems (5 marks)

Research the difference between the Babylonian Number System and today's Hindu-Arabic Number System. Use the URL below to understand how the Babylonian System works.

<https://www.basic-mathematics.com/babylonian-numeration-system.html>

You need to research the answers to the questions below using multiple websites. Present your answers neatly on a separate piece of paper.

a) When was the Babylonian Number System first developed?

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b) What is the 'base' number in the Babylonian Number System?

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c) Draw the number 23 using Babylonian symbols.

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Question 30 continued on the next page

d) In your opinion, why is the Hindu-Arabic Number System commonly used today and not Babylonian?

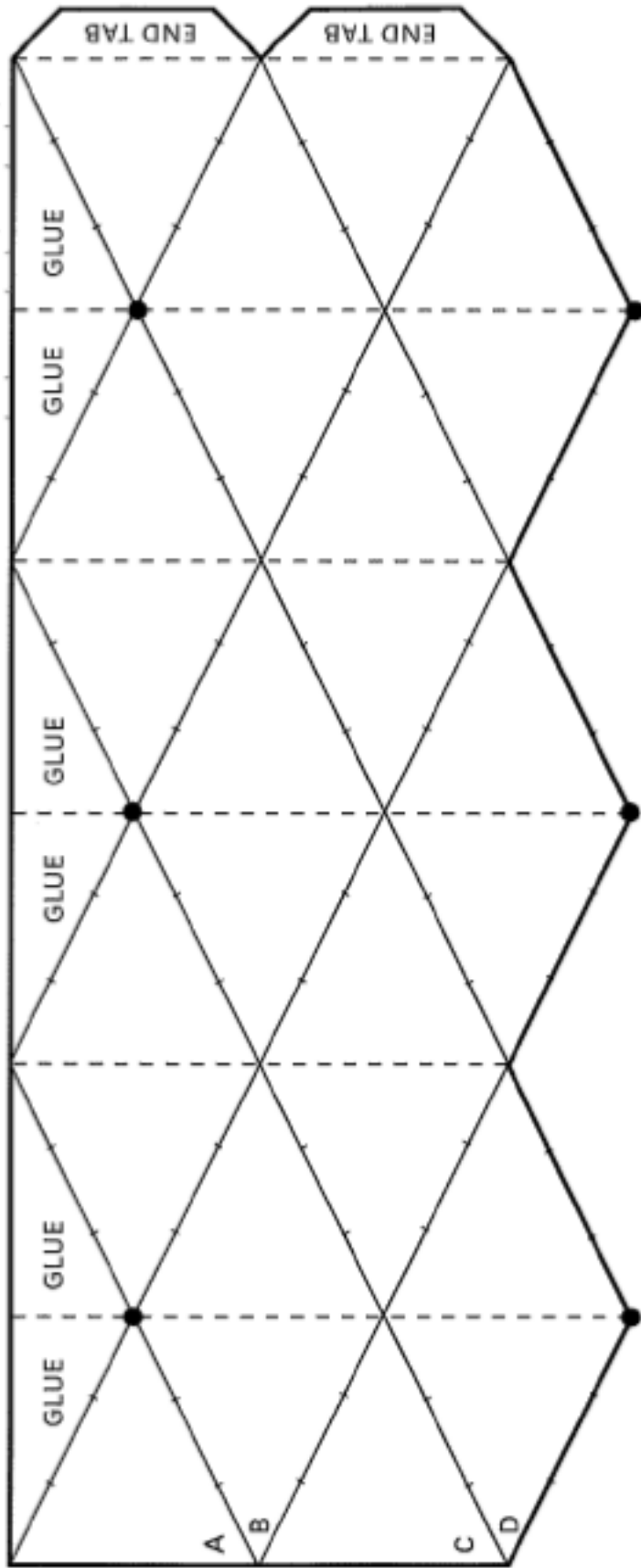
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Marking	
1 mark	Part a) Correct answer
1 mark	Part b) Correct answer
1 mark	Part c) Correct drawing of the number 23
2 marks	Part d) Answer includes at least two reasons

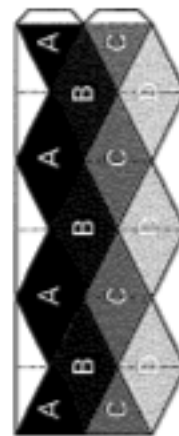
Overall marking comments

Flexangle

Flextangle Template



Pattern Guide



Instructions:

1. Draw different designs in each row of triangular sides. Refer to Pattern Guide for row layout. Be sure to connect the designs at the tick marks.
2. Cut along bold line.
3. Crease dashed lines face to face. Unfold.
4. Crease diagonal lines back to back. Unfold.
5. Gently fold paper to match dot to dot and form a tube.
6. Add glue on tabs marked GLUE and press together.
7. Add glue on end tabs and tuck into open end of tube. Press to seal.

