MEAN, MEDIAN, MODE, RANGE

VENN DIAGRAMS, GRAPHS

What is the Mean?

The mean is the average of a set of numbers.
It is found by adding up the set of numbers and then dividing the total by the number of data points in the set.

How to find the mean

Step 1) Add up all the numbers in the set.

Step 2) Divide the total by the total number of data points in the set.

Examples

Example 1) Find the mean of 5, 7, 8 and 4

Step 1) Add up the numbers to give a total of 5+7+8+4=24
Step 2) Divide the total by the number of data points. 24 ÷ 4 = 6
Answer: the mean is 6.

Example 2) Find the mean of 8, 2, 5, 7 and 13

Step 1) Add up the numbers to give a total of 8+2+5+7+13=35
Step 2) Divide by the number of data points. 35 ÷ 5 = 7
Answer: the mean is 7.

What is the Median?

The median is the midpoint (or middle value) of a set of numbers.
It is found by ordering the set of numbers and then finding the middle value in the set.

How to find the median

Step 1) Order the numbers in the set from smallest to largest.

Step 2) Find the middle number.

- If there is an odd number of values in the set, then the median is the middle value.

- If there is an even number of values in the set, then the median is the average of the two middle values.

Examples

Example 1) Find the median of 5, 7, 8, 2 and 4

Step 1) Put the numbers in order: 2, 4, 5, 7, 8
Step 2) There is an odd number of values in the set so the median is the middle value which is 5.
Answer: the median is 5.

Example 2) Find the median of 23, 27, 16, 31

Step 1) Put the numbers in order: 16, 23, 27, 31
Step 2) There is an even number of values in the set, so the median is the average of the middle two values.
(23+27) ÷ 2 = 25
Answer: the mean is 25

Example 3) Find the median of 7, -4, 9, -7, -2, 5

Step 1) Order the numbers: -7, -4, -2, 5, 7, 9
Step 2) There is an even number of values in the set, so the median is the average of the middle two values.
To get the average, simply add the two values together and divide by 2:
(-2 + 5) ÷ 2 = 1.5
Answer: the mean is 1.5

What is the Mode?

The mode is the most common (or the data point that appears most often) in a set of data.
It can be found by putting the data into an ordered list and seeing which data point occurs most often.

How to find the mode

Step 1) Put the data into an ordered list.

Step 2) Check that you have got the same number of data points.

Step 3) The mode is the data point which is the most common.

Finding the Mode Examples

Example 1) Find the mode of 3, 6, 4, 3, 2, 4, 7, 8, 6, 3, 9

Step 1) Put the data into an ordered list.
This gives us: 2, 3, 3, 3, 4, 4, 6, 6, 7, 8, 9
Step 2) Check the number of data points in both lists is the same.
Both lists have 11 data points.
Step 3) The mode is the number which occurs most often.
Answer: the mode is 3.

Example 2) Find the mode of 0.6, 0.3, 0.4, 0.2, 0.4, 0.7, 0.6, 0.1, 0.4, 0.9

Step 1) Put the data into an ordered list.
This gives us: 0.1, 0.2, 0.3, 0.4, 0.4, 0.4, 0.6, 0.6, 0.7, 0.9
Step 2) Check the number of data points in both lists is the same.
Both lists have 10 data points.

Step 3) The mode is the number which occurs most often.
Answer: the mode is 0.4.

What is the Range?

The range is the gap between the smallest and largest data point.
It is found by putting the data into an ordered list and find the difference between the largest and smallest amount.

How to find the range

Step 1) Put the data into an ordered list.

Step 2) Check that you have got the same number of data points.

Step 3) The range is the difference between the largest and smallest data point.

To find the range simply subtract the smallest number from the largest number.

Finding the Range Examples

Example 1) Find the range of 14, 21, 9, 32, 27, 15, 12, 30

Step 1) Put the data into an ordered list.
This gives us: 9, 12, 14, 15, 21, 27, 30, 32
Step 2) Check the number of data points in both lists is the same.
Both lists have 8 data points.
Step 3) The range is the difference or gap between the largest and smallest numbers.
Answer: the range is 32-9=23.

Name Date

MEAN, MEDIAN, MODE AND RANGE SHEET 1

Find the mean, median, mode and range in each of the sets of data.

1)	15, 23, 19, 20, 23		5)	22, 37, 19, 25, 37, 51, 82	
order	15, 19, 20, 23, 23		order		
	Mean 100÷5=20	Median 20		Mean	Median
	Mode 23	Range 23-15=8		Mode	Range
2)	2, 7, 4, 2, 3, 6, 11		6)	6, 2, 13, 7, 6, 11, 10, 6, 2	
order			order		
	Mean	Median		Mean	Median
	Mode	Range		Mode	Range
3)	70, 63, 67, 62, 63		7)	109, 104, 96, 103, 104, 107, 98	
order			order		
	Mean	Median		Mean	Median
	Mode	Range		Mode	Range
4)	11, 4, 7, 8, 2, 6, 4		8)	14, 68, 38, 65, 36, 57, 65	
order			order		
	Mean	Median		Mean	Median
	Mode	Range		Mode	Range

Name Date

MEAN, MEDIAN, MODE AND RANGE SHEET 4

Find the mean, median, mode and range in each of the sets of data.

1)	31, 27, 19, 22, 21, 18, 19, 25, 29, 34, 30			
order	18, 19, 19, 21, 22, 25, 27, 29, 30, 31, 34			
	Mean	Median	Mode	Range
2)	8, 14, 7, 15, 14, 11, 10, 9, 19, 11, 14			
order				
	Mean	Median	Mode	Range
3)	106, 112, 98, 102, 112, 95, 106, 101, 98, 103, 117, 98			
order				
	Mean	Median	Mode	Range
4)	142, 353, 271, 396, 217, 92, 198, 271, 313, 502, 424			
order				
	Mean	Median	Mode	Range
5)	96, 103, 106, 98, 95, 97, 101, 105, 103, 98, 101, 95, 101, 117, 99			
order				
	Mean	Mean	Mean	Mean
6)	12, 22, 8, 4, 11, 9, 15, 9, 11, 10, 8, 12, 11, 18, 8, 10, 12, 8			
order				
	Mean	Mean	Mean	Mean

Name Date

MEAN, MEDIAN, MODE AND RANGE PROBLEMS 2

1) In a times table test, a group of 9 children score 25, 17, 21, 25, 23, 21, 27, 21 and 18 out of a total of 30. Find their mean, median, mode and range.

Mean Median Mode Range

2) The salamanders have a competition to see how far they can jump. Their results are as follows:

Captain	Sally	Quadra	Tyger	Frazer	Quadra
2.3m	3.5m	1.7m	4.3m	2.1m	1.7m

Find the mean, median, mode and range of their jumps.

Mean Median Mode Range

3) On a day in January the temperatures for 7 places around the world are as follows:

Amsterdam 5°C	Hong Kong 15°C	Moscow -17°C	Toronto -17°C
Cape Town 20°C	Minneapolis -21°C	New York -6°C	

Find the mean, median, mode and range of temperatures.

Mean Median Mode Range

Name Date

BAR GRAPHS SHEET 4A - WINGSPANS

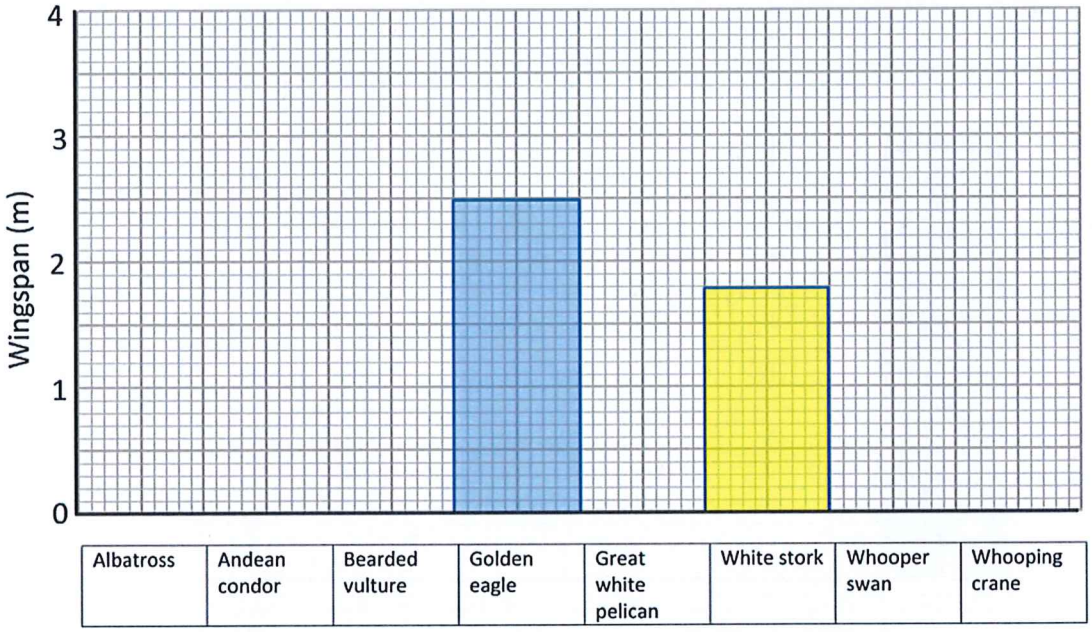
Here are the wingspans of some of the biggest birds in the world.

Bird	Wingspan (m)
Albatross	3.7
Andean condor	3.2
Bearded vulture	2.8
Golden eagle	
Great white pelican	3.6
White stork	
Whooper swan	2.8
Whooping crane	2.3

1) Complete the bar graph for the birds.

2) Fill in the table for the wingspan of the golden eagle and the white stork.

3) How much longer is the wingspan of the albatross than the whooper swan?



4) Which bird has a wingspan which is 90cm more than the whooping crane?

5) What is the difference between the longest and shortest wingspan?

Name Date

BAR GRAPHS SHEET 4E – LONGEST JUMPERS

Here are some of the furthest jumpers in the men's long jump event.

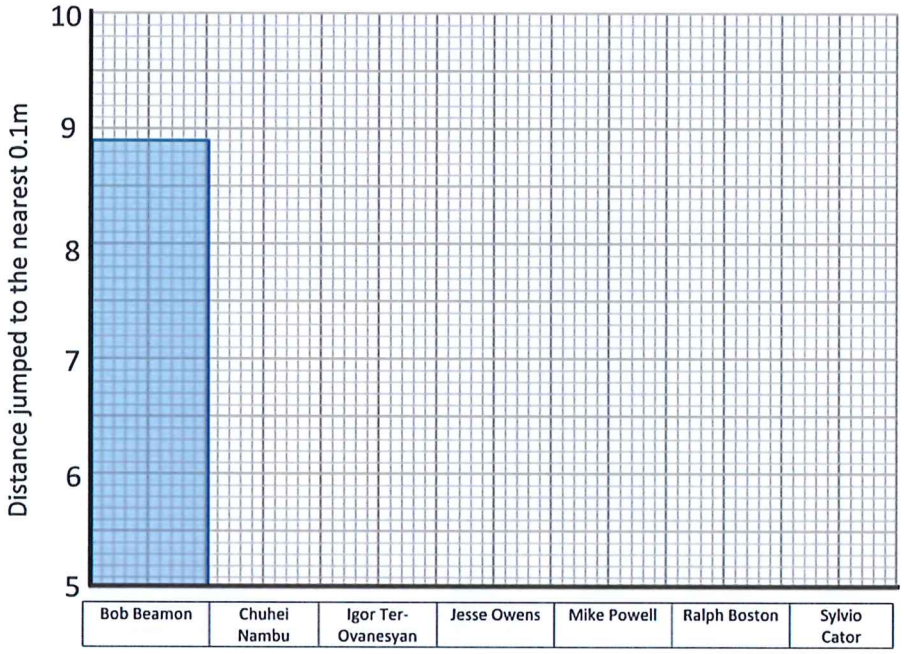
Who	Distance	Order (1=biggest)	Nearest 0.1m
Bob Beamon	8.9m		8.9m
Chuhei Nambu	7.98m		
Igor Ter-Ovanesyan	8.35m		
Jesse Owens	8.13m		
Mike Powell	8.95m	1	
Ralph Boston	8.34m		
Sylvio Cator	7.93m		

Souce: Wikipedia

1) Fill in the Order column by putting the distances in order (1=longest and 7=shortest)

2) Round all the jumps to the nearest 0.1m and fill in the column.

3) Complete the bar graph using the data you have rounded.

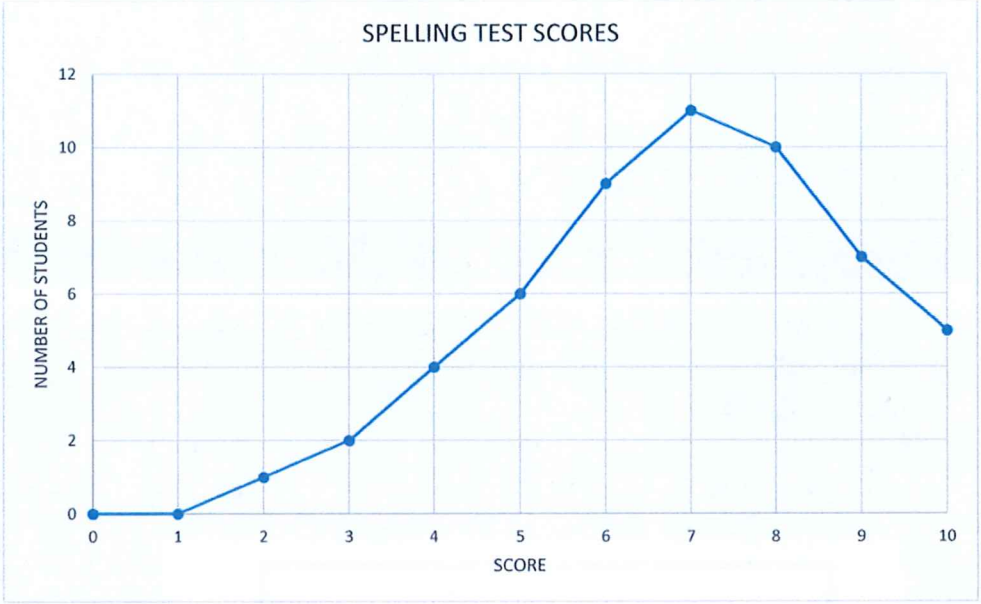


4) What is the difference between the length of the longest and shortest jump?

Name Date

LINE GRAPH WORKSHEET 4C SPELLING TEST

Here are a set of spelling test scores out of 10 marks for a group of 55 students.



Answer the following questions about the data.

1) What was the modal (most common) score? _____
2) How many students scored exactly half-marks? _____
3) How many students score less than half-marks? _____
4) How many students scored more than 8 marks? _____
5) Which spelling score did exactly 7 students get? _____
6) Answer **true**, **false** or **can't tell** to each of the statements below:

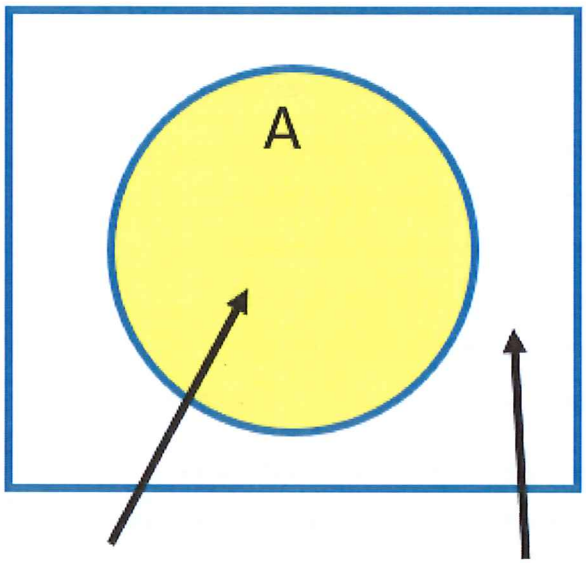
a)	The range of the student's scores is 10 marks.	
b)	More than half the students scored 7 marks or above.	
c)	The students in the class are good at spelling for their age.	
d)	A fifth of the students scored 7 marks.	

What is Venn Diagram?

A Venn diagram is a way of classifying groups or sets of objects with the same properties.
In more advanced mathematics, venn diagrams are a part of set theory.
Typically, a venn diagram has one, two or three circles that intersect each other.
There is also typically a rectangle that the circles are inside which represents the universal set.
The universal set is the place where ***everything*** that is being sorted has to go inside.

Venn Diagrams with one circle (or set)

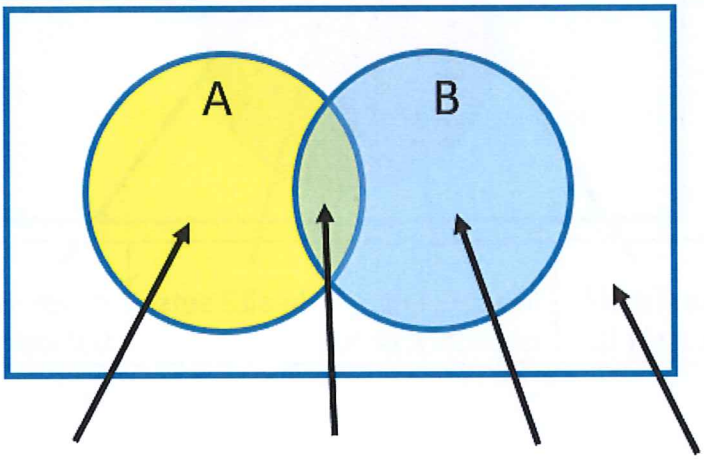
The simplest venn diagrams just have one set (which is usually a circle) inside the universal set.
The set is labelled with the property it has.
Any numbers or objects to sort which have this property go inside this set.
Any numbers or objects which do not have this property go outside this set in the universal set.



Objects here are in set A.	Objects here are not in set A.

Venn Diagrams with two circles (or sets)

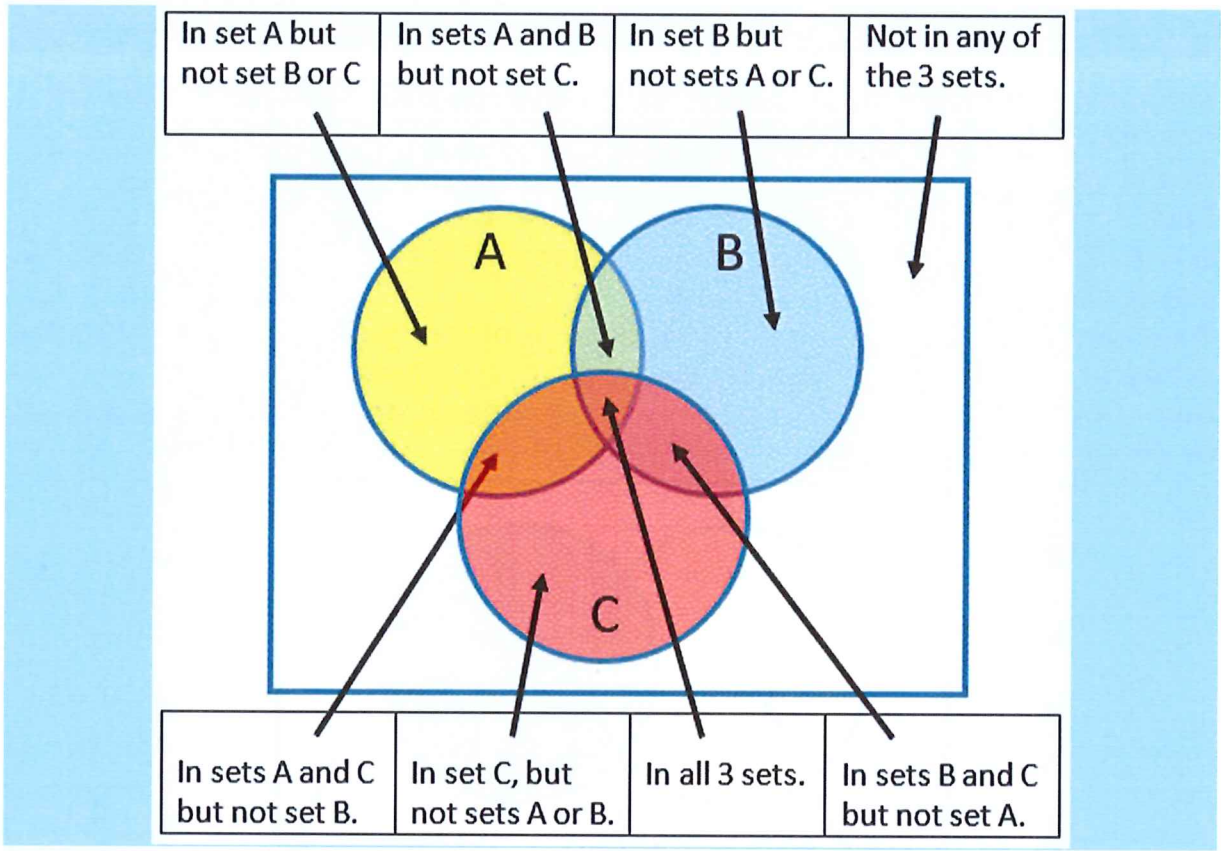
The most common venn diagrams have two sets (usually circles) inside the universal set.
The circles will intersect each other and have an area in common.
Each circle or set is labelled with the property it has.
Any numbers or objects which have both properties go in the intersection of the circles.
Any numbers or objects which have just one property go into the set with the property (but not the intersection).
Any numbers or objects which do not have either property go outside this set in the universal set.



Objects here are in set A but not set B	Objects here are in both sets A and B	Objects here are in set B but not set A	Objects here are not in set A or set B.

Venn Diagrams with three circles (or sets)

These venn diagrams work in a very similar way to the diagrams with two circles.
The circles will intersect each other and there will usually be an area where all 3 circles intersect.
Each circle or set is labelled with the property it has.
Any numbers or objects which have all the properties go in the intersection of the 3 circles.
Any numbers or objects which have two of the properties go in the intersection of the 2 circles which have the properties.
Any numbers or objects which have just one property go into the set with the property (but not the intersections).
Any numbers or objects which do not have any of the properties go outside the sets in the universal set.

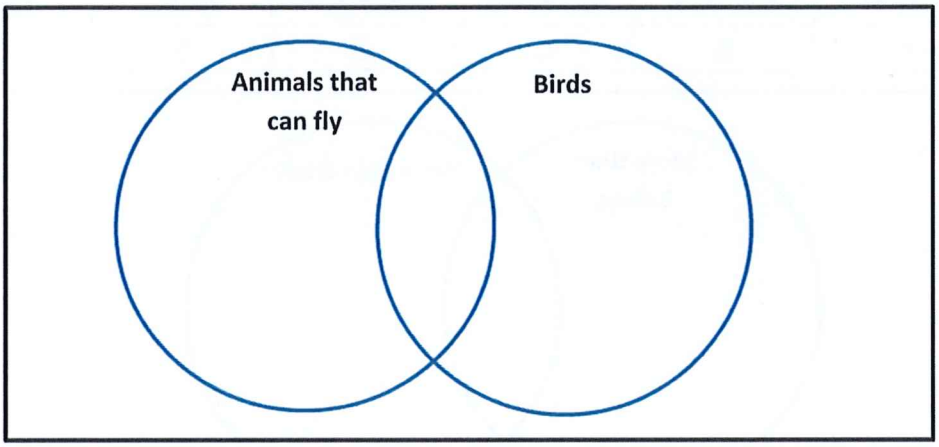

In set A but not set B or C
In sets A and B but not set C.
In set B but not sets A or C.
Not in any of the 3 sets.
A
B
C
In sets A and C but not set B.
In set C, but not sets A or B.
In all 3 sets.
In sets B and C but not set A.

Name Date

VENN DIAGRAMS SHEET 1

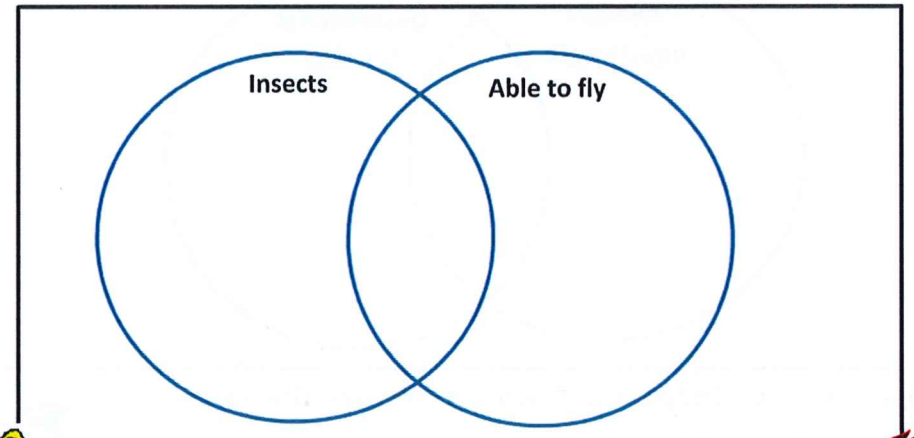
1) Put the following animals into the correct place in this Venn diagram.

a) duck b) crab c) penguin d) bat e) sparrow



2) Put the following animals into the correct place in this Venn diagram.

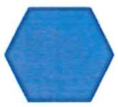
a) rabbit b) butterfly c) ant d) crow e) bee

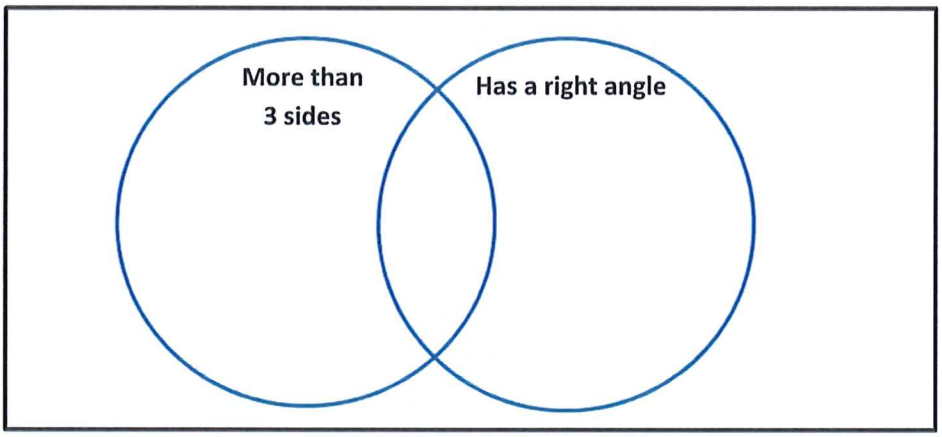


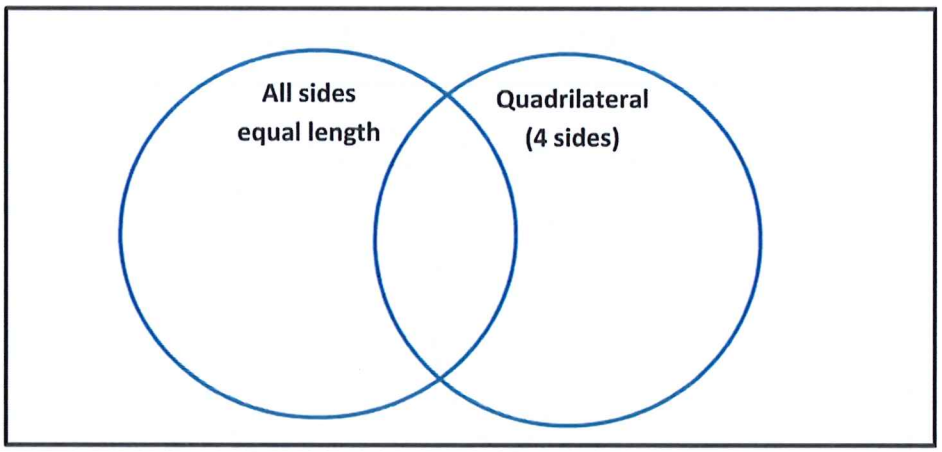
Name Date

VENN DIAGRAMS SHEET 4

Put the letters for these shapes in the correct places in both Venn diagrams.

					
A	B	C	D	E	F





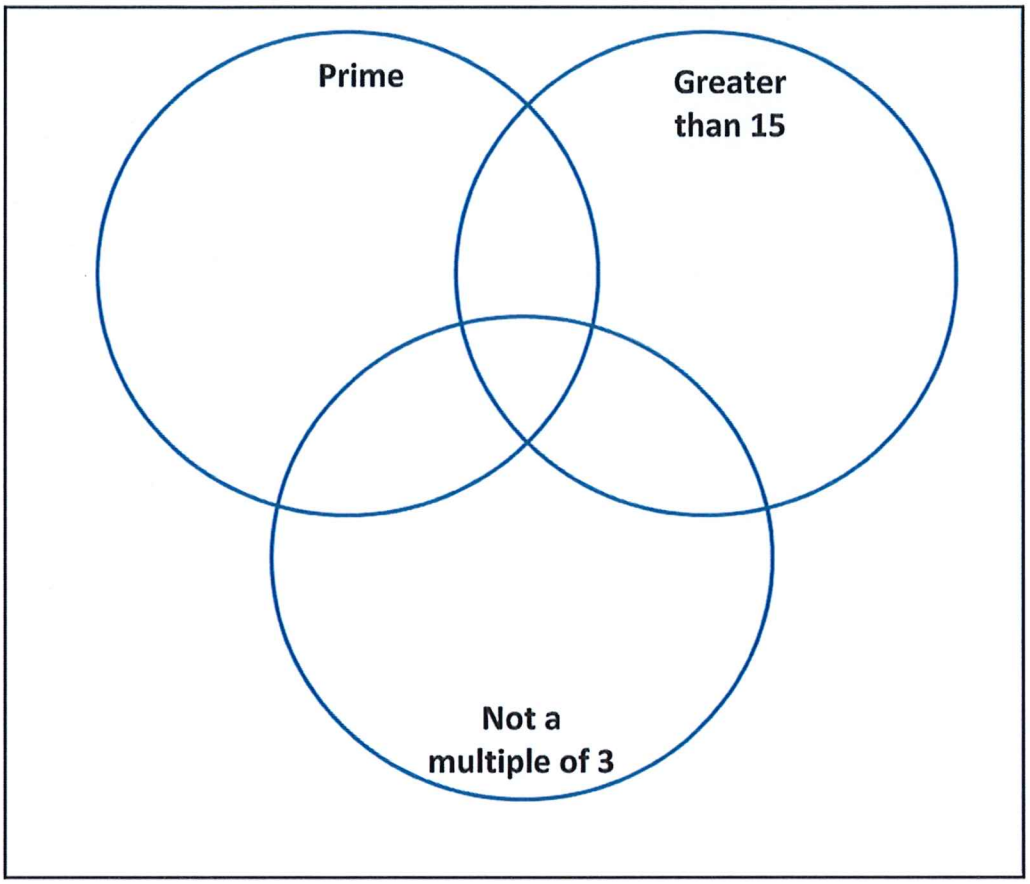
Choose your own shape and draw it in each of the Venn diagrams in the correct place.

Name Date

3 CIRCLE VENN DIAGRAM SHEET 4:4

Put these 8 numbers in the correct places in this Venn diagram.

17	24	26	18	7	13	9	3



Can you add in an extra number into each of the different sections of the Venn diagram?