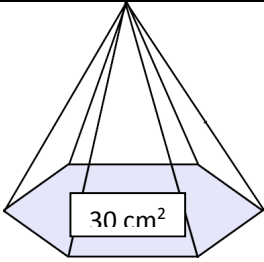
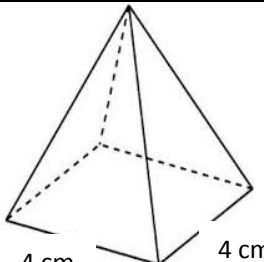
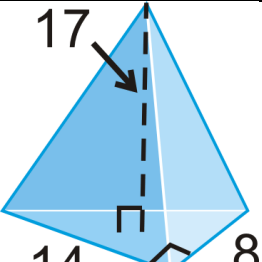
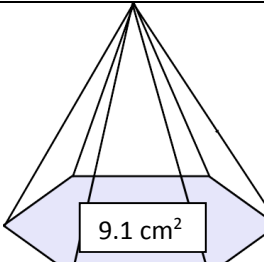
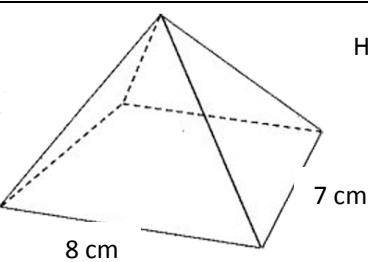
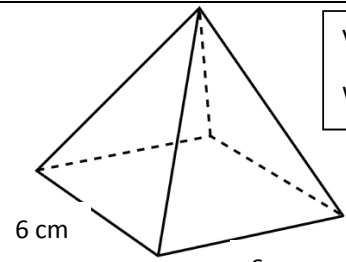
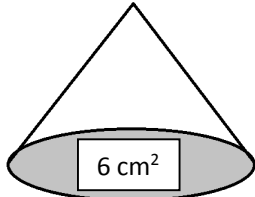
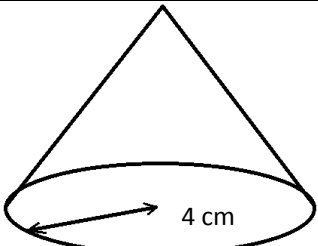
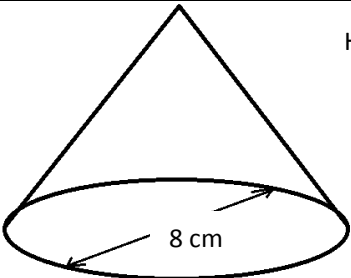
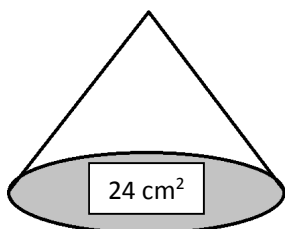
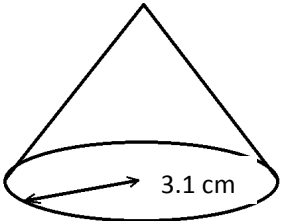
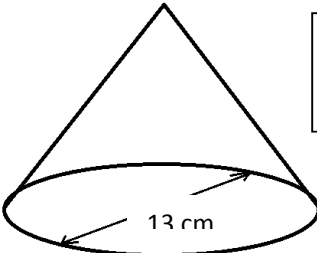


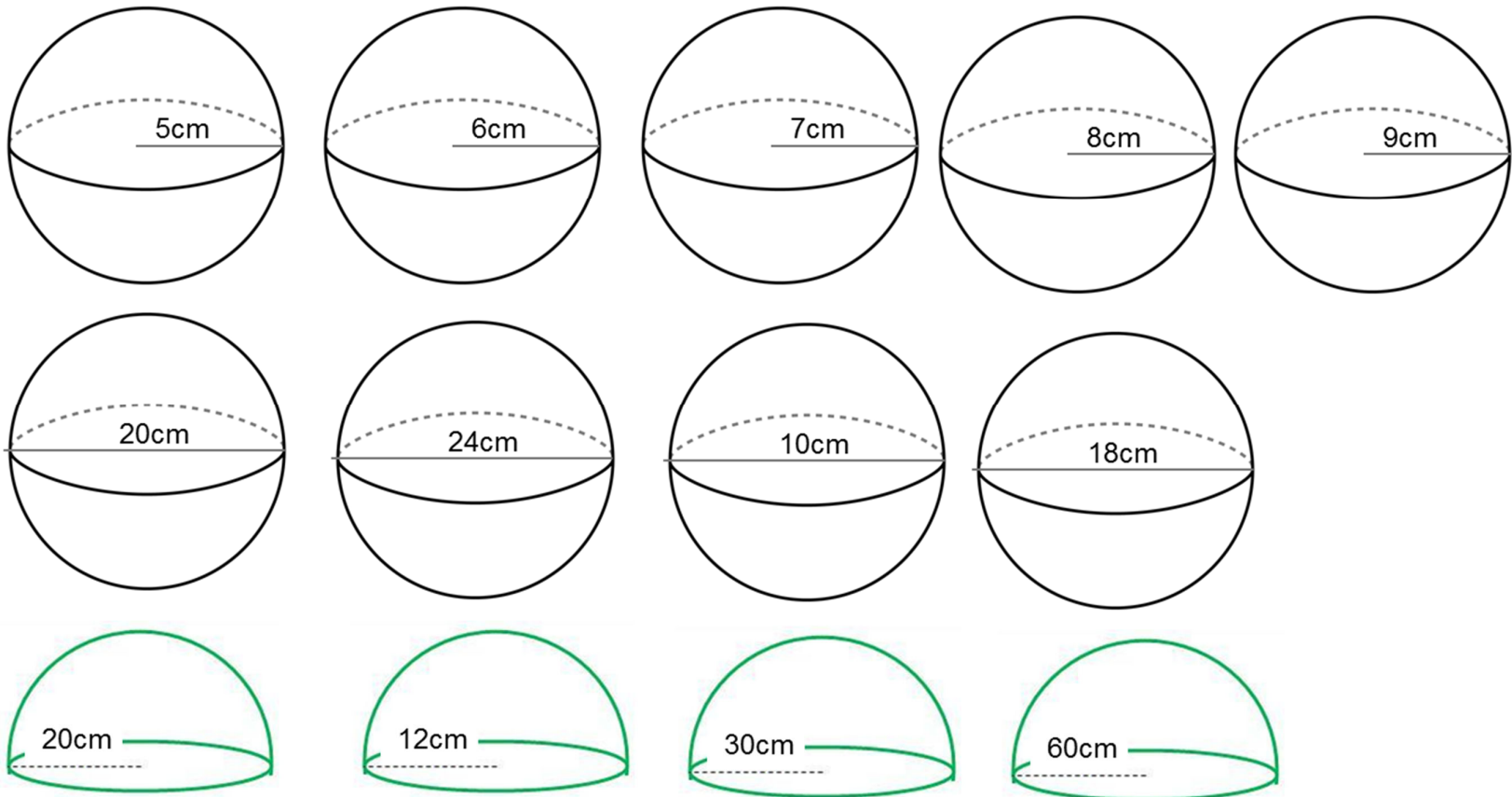
Year 8
Foundation
Work Pack 4

Calculate the volume of these pyramids and cones. **Volume of pyramid = area of base x height / 3; Volume of cone = $\pi \times \text{radius}^2 \times \text{height} / 3$**

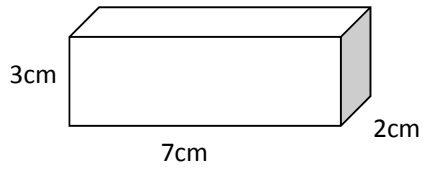
	Red	Amber	Green
Pyramid	 <p>Height = 12 cm</p>	 <p>Height = 3 cm</p>	
	 <p>Height = 6 cm</p>	 <p>Height = 18 cm</p>	 <p>Volume = 156 cm³ What is the height?</p>
Cone	 <p>Height = 11 cm</p>	 <p>Height = 9 cm</p>	 <p>Height = 14 cm</p>
	 <p>Height = 8.5 cm</p>	 <p>Height = 12 cm</p>	 <p>Volume = 310 cm³ What is the height?</p>

Volume of Sphere

$$V = \frac{4}{3} \pi r^3$$



Surface Area of Cuboids



Area of front:

Area of back:

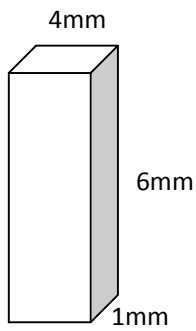
Area of side:

Area of side:

Area of top:

Area of bottom:

Total surface area:



Area of front:

Area of back:

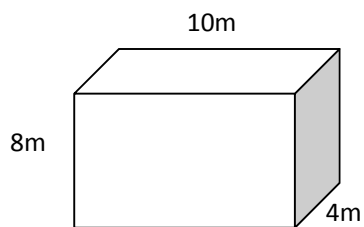
Area of side:

Area of side:

Area of top:

Area of bottom:

Total surface area:



Area of front:

Area of back:

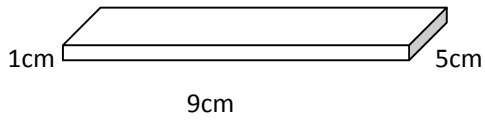
Area of side:

Area of side:

Area of top:

Area of bottom:

Total surface area:



Area of front:

Area of back:

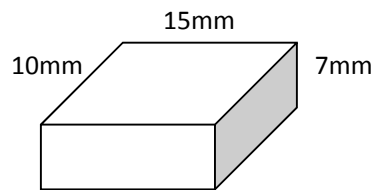
Area of side:

Area of side:

Area of top:

Area of bottom:

Total surface area:



Area of front:

Area of back:

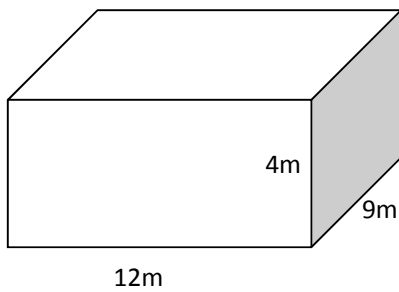
Area of side:

Area of side:

Area of top:

Area of bottom:

Total surface area:



Area of front:

Area of back:

Area of side:

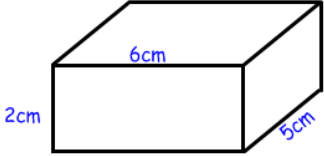
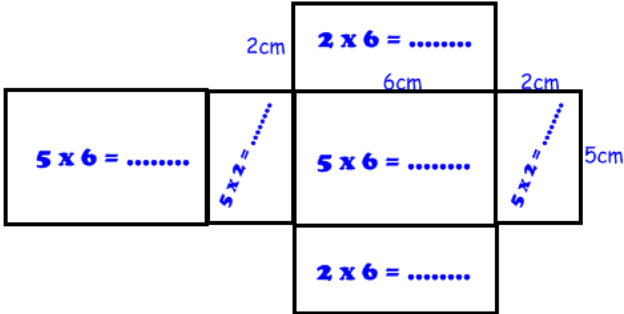
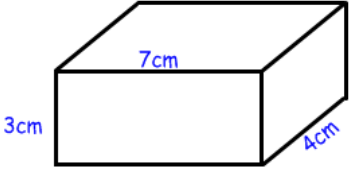
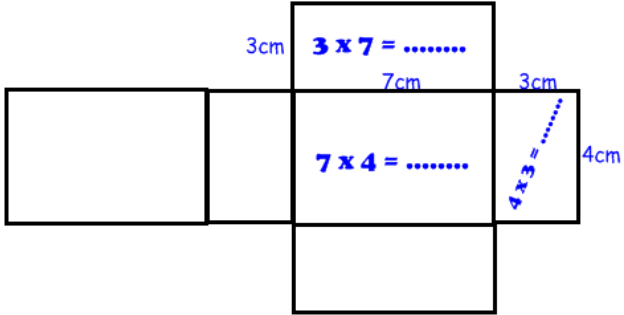
Area of side:

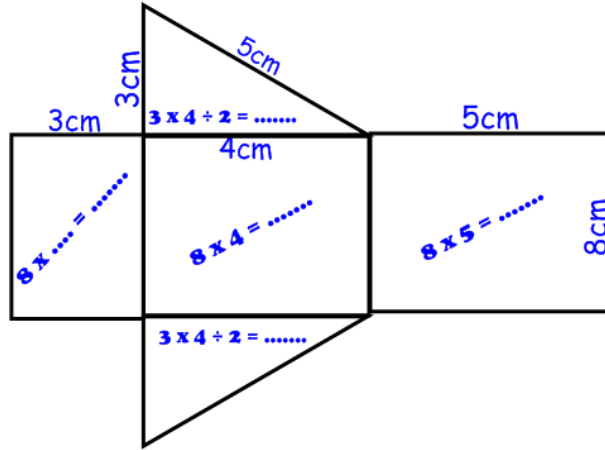
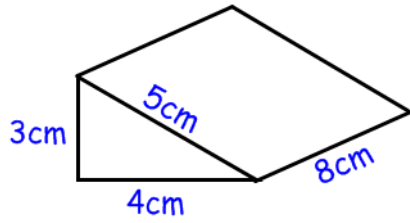
Area of top:

Area of bottom:

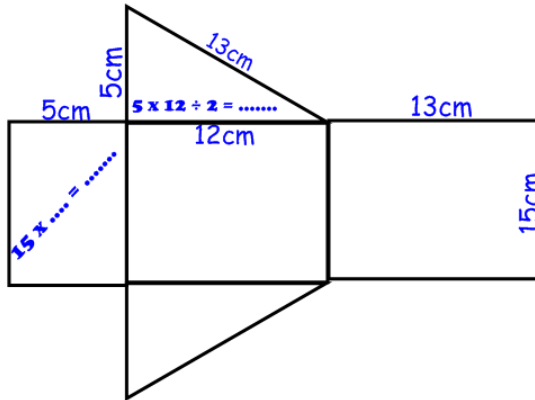
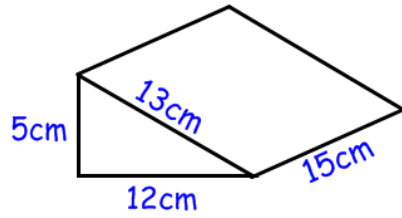
Total surface area:

Surface Area of Prisms

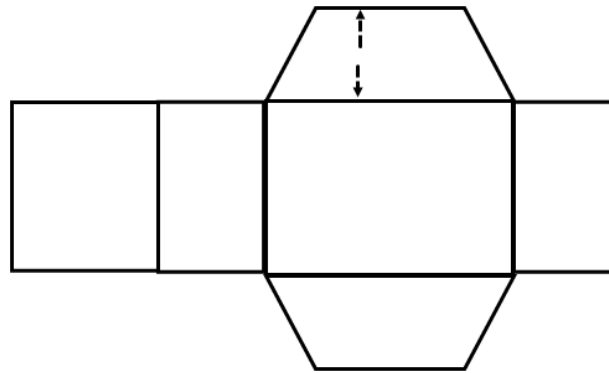
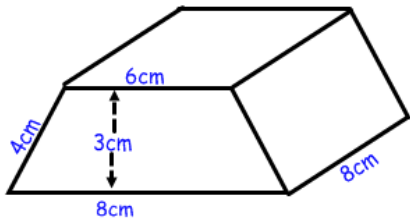
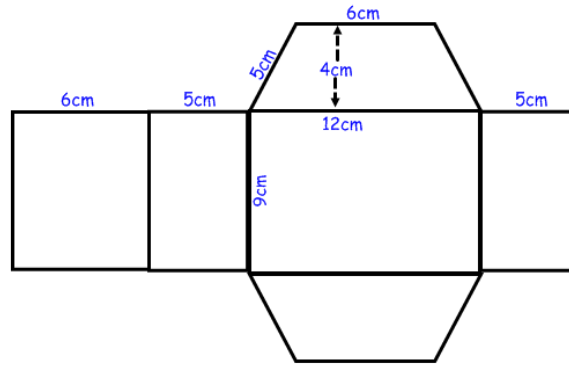
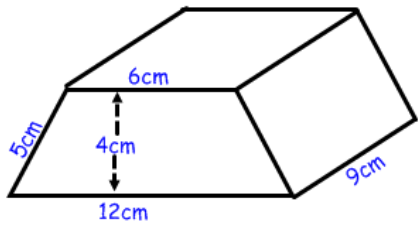
Shape	Net (Show Working on Diagram)	Final Calculation and Answer
		<p align="center">..... + + + + +</p> <p align="center">=cm²</p>
		<p align="center">..... + + + + +</p> <p align="center">=cm²</p>



..... + + + +
 =cm²



..... + + + +
 =cm²



1
2



Mean

Objective: to be able to find the mean from lists of numbers and situations

Starter questions

Copy this example of finding the mean:

4, 5, 6

$$4+5+6=15$$

There are 3 numbers

$$15 \div 3 = 5, \text{ the mean is } 5.$$

Work out the total of these lists of numbers:

1. 3,4,5,6
2. 7,10,13,16
3. 8,10,12,14
4. 20,19,18,17
5. 21,25,29,33

There are 5 numbers which have a total of 70, the difference between the biggest and smallest (range) is 10, what could they be?

Main questions

1. Find the mean from these numbers:

- a. 5,3,4
- b. 10, 11, 1, 7
- c. 15, 8, 7, 10
- d. 14, 2, 4, 1, 4
- e. 7, 8, 5, 10, 4, 2
- f. 24, 26, 32, 17, 1
- g. 0.2, 0.1, 0.5, 0.3
- h. 20, 9, 3, 8, 8, 8
- i. 17, 18, 15, 10, 8, 2, 10
- j. 0,0,0,0,18

2. How would you find the:

- a. Mean age of players in a football team
- b. Mean height of a family
- c. Mean number of sweets eaten by boys in a day
- d. Mean number of hours spent watching TV for a pupil each night
- e. Mean number of times someone says "LOL" a day

3. Write down 3 possible lists of numbers if there are:

- a. 4 numbers with a mean of 6
- b. 5 numbers with a mean of 8
- c. 7 numbers with a mean of 9

Star questions

How could you calculate the mean number of times the word "the" appears on a page? Pick any book and work it out by using at least 5 different pages? Can you think of a word which would have a higher or lower mean than "the"?

Averages

Mode (Most Common)

The number that is in the list the most times.

E.G: 1, 4, 4, 4, 2, 9, 4

The most common number in this list is the number 4 so the **MODE is 4**.

Median (The Middle Number)

Once the list of numbers has been put in order smallest to biggest the Median is the number in the middle of the list.

E.G: 1, 4, 4, 4, 2, 9, 4

1st put the numbers in order smallest to biggest – 1, 2, 4, 4, 4, 9

2nd cross off each number (1 from each end of the list) until there is only 1 left in the middle

~~1~~ ~~2~~ 4, 4, 4 ~~9~~

4 is the number in the middle of the list so the **MEDIAN is 4**.

Mean (The mean one!!!)

Add all the numbers in the list together then divide by how many numbers are in the list.

E.G: 1, 4, 4, 4, 2, 9, 4

1st add the numbers together $1+4+4+4+2+9+4 = 28$

2nd divide the answer by how many numbers are in the list $28 \div 7 = 4$

So the **MEAN is 4**.

Range (The difference)

Find the difference between the biggest and the smallest number.

E.G: 1, 4, 4, 4, 2, 9, 4

The biggest number is 9 and the smallest number is 1. Calculate: $9 - 1 = 8$

The **Range is 8**.

Mode (Most Common)

Find the Mode:-

a) 1,7,7,8,9,2

b) 9,7,8,5,1,1,1

c) 2,2,2,2,2,2,2

d) 1,1,7,7,7,4,1

e) 2,1,3,3,4,4,3,4

f) 9,4,5,8,7,2

g) 1,7,4,3,2,1

h) 1,2,3,4,5,6

i) 1,1,3,1

j) 9,7,2,4,4,1,1



HINT:

You can have more than one
number for the Mode



HINT:

If there is no mode then the answer
is **NO MODE!**

Median (The middle number)

Find the Median:-

a) 4,3,2,2,1,4,3

b) 9,9,9,7,2,1,1

c) 2,4,9,8,2

d) 1,1,1,1,4

e) 4,3,2,1

f) 8,7,5,5,4,3,1,1,2

g) 1,2,3,4,5,6

h) 9,7,6,4,1,2

i) 7,6,1,2,3

j) 4,4,4,2,1,1,1

HIINT:

Remember to put the numbers in order from smallest to biggest first.

HINT:

If there are two numbers in the middle of the list find the Median by adding the two numbers together then divide the answer by 2.

E.G:

1,2,4,5,6,7

$4 + 5 = 11$

$11 \div 2 = 5.5$

The Median in this case would be 5.5

Mean (The mean one!!!)

Find the Mean:-

a) 2,4,6,10,2,2,2

b) 1,4,5,1,4

c) 1,7,10

d) 2,7,1,8,2,9,1,2

e) 1,1,1,2,1,2,1,1,2,8

f) 7,9,1,3,5

g) 3,9,6,1,2,1,1,2,2



REMEMBER:

Step 1- add all the numbers
together

Step 2- divide the answer by how
many are in the list.

Range (The difference)

Find the Range:-

- a) 9,10,8,4,3
- b) 9,2,1,3,1
- c) 4,7,8,1,3
- d) 1,1,2,4,5
- e) 8,7,6,5,4,3,2
- f) 10,4,7,2,3
- g) 9,9,8,7,1
- h) 4,5,7,2,3
- i) 10,7,3,7,1
- j) 7,6,5,2,3,4,9,1

HINT:

**You might find it easier to
put the numbers in order
from smallest to biggest
first.**



Challenge!



Find the Mode,

Median, Mean and

Range:-

a) 8,10,2,5,5,5

Mode =

Median =

Mean =

Range =

b) 6,2,2,1,1,7,2

Mode =

Median =

Mean =

Range =

c) 9,9,6,1,5

Mode =

Median =

Mean =

Range =

d) 9,4,5,6,1

Mode =

Median =

Mean =

Range =

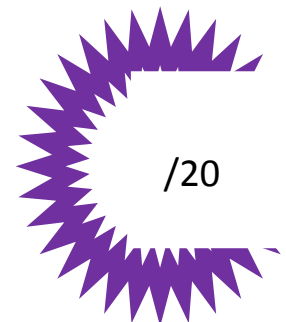
e) 10,9,2

Mode =

Median =

Mean =

Range =



Averages from a frequency table

Example 1

4, 3, 2, 3, 1, 3, 0, 0, 3, 0

Number	Frequency	Number x frequency
0		
1		
2		
3		
4		
Total		

So in this case:

$$\text{Mean} = \frac{\quad}{\quad} = \frac{\quad}{\quad} = \quad$$

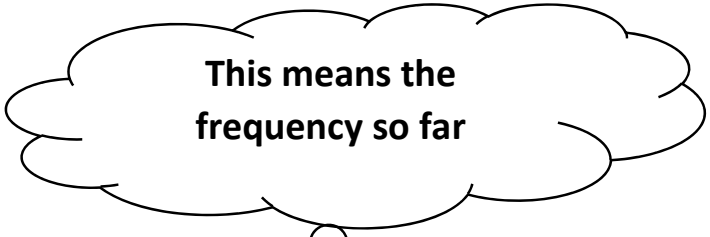
Example 2

3, 4, 2, 4, 2, 0, 3, 3, 2, 1

Number	Frequency	Number x frequency
0		
1		
2		
3		
4		
Total		

$$\text{Mean} = \frac{\quad}{\quad} =$$

$$\text{Median} = \frac{\quad + \quad}{2} \text{ number}$$



Example 1

4, 3, 2, 3, 1, 3, 0, 0, 3, 0

Number	Frequency	Cumulative frequency
0		
1		
2		
3		
4		

So in this case:

$$\text{Median} = \frac{\quad + \quad}{2} = \text{number}$$

Example 2

3, 4, 2, 4, 2, 0, 3, 3, 2, 1

Number	Frequency	Cumulative frequency
0		
1		
2		
3		
4		

$$\text{Median} = \frac{\text{number}}{2} = \text{number}$$

Questions to have a go at

Add extra columns on this sheet but show your working and answers in your book.

1) Calculate the mean

Number	Frequency	Number x frequency
10	3	
11	4	
12	1	
13	2	
14	3	
15	1	
Total		

2) Calculate the median

Number of sweets	Frequency	Cumulative Frequency
23	1	
24	4	
25	9	
26	3	
27	3	

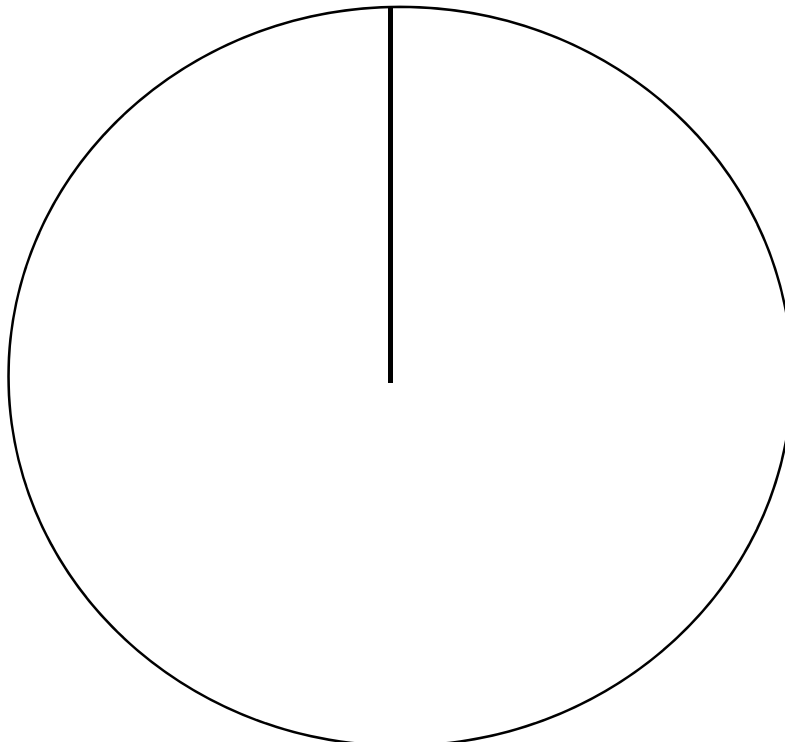
3) Calculate the median for Q1 and the mean for Q2.

Pie Charts

How to draw an accurate pie chart

- Find the total of the given data
- Divide the piece of data by the total, then multiply it by 360
- (if needed, round the answer to the next whole number)
- Draw a line from the top of the circle to the centre
- Using a protractor, measure your angle (the answer to the above sum) from this line, mark this with a dot
- Draw a line from the centre of the circle, to point marked

Vehicle	Amount of vehicles	Degrees on pie chart
Car	140	187
Bike	70	93
Van	55	73
Bus	55	7
Total	270	360



Player	Goals	Degrees on pie chart
G.Boyd	80	
T.Henry	248	
G.Zola	193	
W.Rooney	130	
Total	651	360

