



Dear Year 5 and 6,



Thank you again for your continued hard work and thank you to those who have sent work in, I have absolutely loved reading through it all. I am thrilled with how hard you are all working. I am missing you all very much but hope you've all been enjoying your time at home.



This work pack is for the next three weeks and is still mainly focused around our end of year cultural topic 'Australia'!



Remember to go on IDL and mathletics as much as possible and try to read everyday.



Here are some other ideas of activities you might also like to try out:

- Joe Wicks is streaming live PE sessions Monday to Friday on his YOUTUBE channel.
- Try <https://family.gonoodle.com/> to keep active
- Why not have a go at scratch and do some creative computer programming: <http://scratch.mit.edu/explore/projects/games/>
- Get out into the garden and become a nature detective and get some ideas at <https://naturedetectives.woodlandtrust.org.uk/naturedetectives/>
- <https://www.bbc.co.uk/bitesize/levels/> has some amazing resources which might help!
- Cosmic kids for yoga and stretching activities
- Search 'peace out' for stories to help you sleep.



Please contact me at any point by email or by phone as I am always here to help. Enjoy and stay safe!



Mrs Stocks



rachael.stocks@swarland.northumberland.sch.uk





Transition



I am really pleased your zoom call with Evie was a success and I've heard from Charlotte how much you have learned. Thank you very much to Mrs Garland for arranging this!



Please make sure you have also had a look on the Duchess website:



<https://sites.google.com/dchs-alnwick.uk/transition/home>



Remember to complete your treasure chest and your pen portrait and email them in – this will really help your new teachers get to know you!



If you have any more questions please email me with them and I can forward them on to The Duchess, where they will continue to upload answers on to their website.



I am hoping to see you all before the summer holidays, whether this will be virtually or in person. Please remember that you can pick up the phone to call me or send me an email if you want to chat. I know you will all be feeling different emotions about your new school. If you are feeling nervous about moving to your new school, please remember this is perfectly normal. Why not create your own worry monster or worry box, where you can post any worries. Remember talking helps (could be a parent, sibling or a school friend).



In the mean time, please can you email with your favourite memories of your time at S'warland, as many as you like! This will help me collate a celebration of Year 6's time at S'warland!



Thank you,
Mrs Stocks





Cross curricular topic based on Australia



Activity 1:



Captain James Cook



- Captain James Cook first discovered Australia in April 1770. Use the internet to find out about who Captain Cook was and the voyage that led him to discover Australia. You might like to find out: What his ship was called, where did he land? Who did he have with him? What did he find there? Use a publishing package such as Word or Publisher to record the key points that you find. You might also like to import some images from Google.



- Draw a labelled diagram of Captain Cook's ship, write around it what life was like on board. Could you make a model out of cardboard? Why not adapt it to make it your own but with an 18th Century feel?



- Many of the first people who were brought to live in Australia were convicts! Find out what life was like for them on board the ship. Make a list of the positive and negative points of being sent to Australia from the UK.



- Write a diary entry from the point of view of a convict. How are you treated? How do you spend your days? What food do you eat? How are you feeling about the new life ahead of you?



- When Captain Cook and his men discovered Australia, there were already people living there. Who were they? How do you think they felt about the arrival of these strange new people?





Activity 2:



Aboriginal People



- Watch Aboriginal dance and music on YouTube.
https://www.youtube.com/watch?v=OhyKsEn6_So



- Traditional Aboriginal Food. Aborigines traditionally ate foods that may surprise you (and make your stomach turn!) Write a menu for an Aboriginal meal!



- Aboriginal art symbols. Aborigines used paintings, drawings and symbols on rocks and caves to tell others where food and water could be found and what animals were in the area. Have a go at creating some of these symbols and pictures yourself. If you can, send a picture to me to see if I can unlock your code!



- Aborigines used plants and some creatures from the bush to create medicine. Find out what they used to treat: a cold, burns, headaches, sores and wounds and teething babies!



- Some Aboriginal tribes built shelters out of sticks and rocks, have a go yourself!





Activity 3:



Aboriginal stories

- Storytelling is very important in Aboriginal culture! Listen to some traditional Aboriginal stories on You Tube. Try searching for: The Koala with the stumpy tail, The Rainbow Serpent, Tiddalick the frog, How the kangaroo got it's tail or, How the turtle got it's shell. What do all of the stories have in common?
- Try to write your own Aboriginal story- For Example: How the Kangaroo learnt to jump, or Why the spider has eight legs or perhaps, why the snake slithers.
- One of the ways that Aborigines tell stories is through the use of 'Dream Stones' and the stories told are called 'Dreaming Stories' These stories are told by drawing symbols and pictures onto rocks and then using these as prompts to tell the story. Choosing one of the stories you have watched on YouTube, collect some flat stones and make your own dream stones to tell one of the stories you have watched.



Activity 4:



Traditional Aboriginal Art



- Traditional Aboriginal art consists of: body art, rock engraving, dot painting, symbols in the sand and rock painting. Look on Google images for some examples and fill in a comparison chart looking at the materials and colours used and the purpose of each of the examples of art.



- Try recreating some of the Aboriginal art you have seen (send us pictures please!)



- Listen to the Digeridoo and traditional Australian songs on You Tube (e.g Waltzing Matilda, Kookaburra etc.) Learn one of the songs.



<https://www.youtube.com/watch?v=IsVN0V5x370>



- Make your own Digeridoo using cardboard tubes, decorate it with Aboriginal art!



Finally...if the weather is nice enjoy an 'Australian' barbecue in the garden!





Year 6

Grammar

WB 22.6.20 layout devices pg 41

WB 29.6.20 revision 3

WB 6.7.20 writing task 3 and final test

Spelling

WB 22.6.20 plural nouns: If a noun ends in a consonant + o we often add es to make it plural (potatoes, echoes, heroes)

WB 29.6.20 homophones and words often confused (advice and advise, practise and practice, licence and license, device and devise)

WB 6.7.20 words containing the letter string ough (thoroughly, borough, although)

Please see activity suggestions in guidance handed out in the first week.

Maths

Please continue using the mental maths booklet which was included in your last work pack.

WB 22.6.20 line graphs and circles

Can you create your own data for a line graph?

<https://www.bbc.co.uk/teach/class-clips-video/maths-ks2-understanding-radius-and-diameter/zmgkq3>

WB 29.6.20 pie charts and calculating the mean

Can you create your own pie chart, using your own data collected?

WB 6.7.20 measuring with a protractor and finding angles in shapes

Read and Interpret Line Graphs

Read and Interpret Line Graphs

1a. Which of the following could you show on a line graph?

A. How much snow falls over 24 hours.

B. Your favourite pizza toppings.



VF

1b. Which of the following could you show on a line graph?

A. A count of how many push-ups you can do every day for a month.

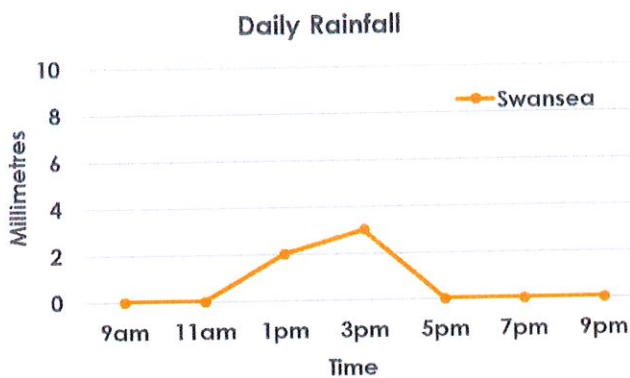
B. How many different animals are at the zoo.



VF

2a. True or false?

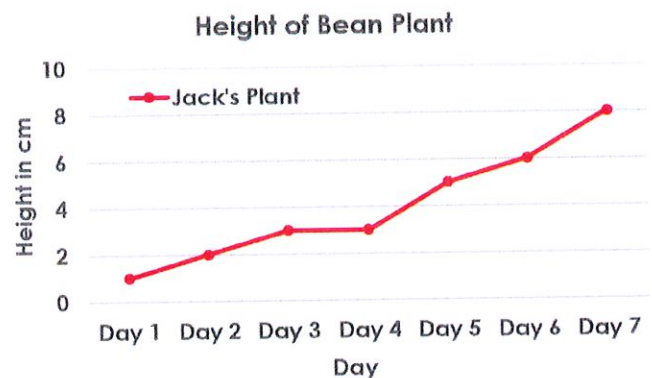
The graph shows that it rained from 9am to 9pm in Swansea.



VF

2b. True or false?

The bean plant didn't grow higher than 4cm.



VF

3a. According to the graph, which statements are correct?

A. The stand was busiest from 11am-12pm.

B. The stand sells ice cream.

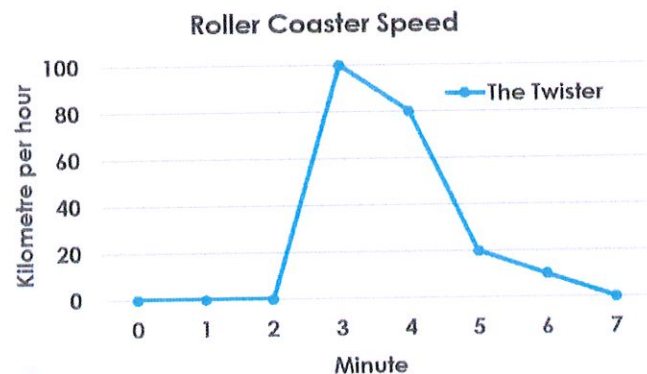


VF

3b. According to the graph, which statements are correct?

A. The roller coaster is called The Drop.

B. The Twister is stationary for the first two minutes.



VF

Read and Interpret Line Graphs

Read and Interpret Line Graphs

4a. Which of the following could you show on a line graph?

- A. The titles of all the books read over a summer holiday.
- B. How far two people can run in 2 hours.
- C. How the price of milk and butter has changed over 20 years.



VF

4b. Which of the following could you show on a line graph?

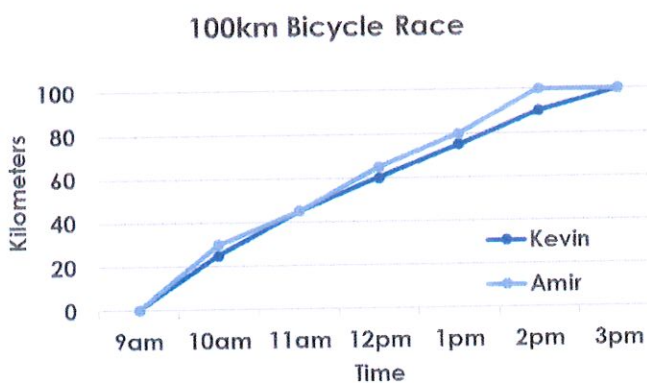
- A. Your height measured on the same day every month for a year.
- B. Water level of two rivers over a month.
- C. The number of flowers growing in your garden.



VF

5a. True or false?

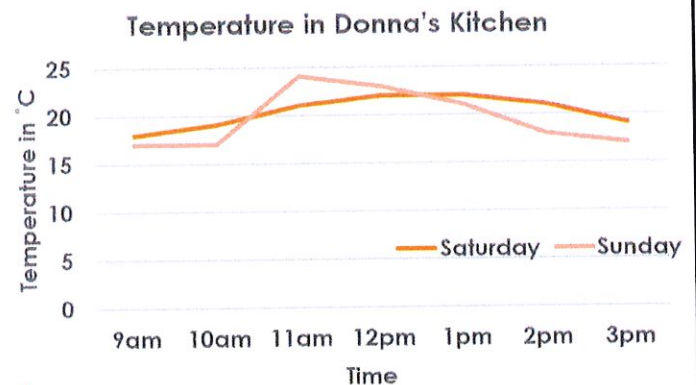
Kevin won the bicycle race.



VF

5b. True or false?

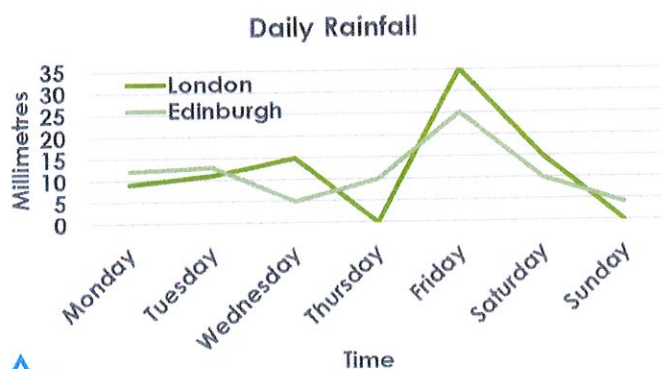
Donna had the heating on in her kitchen on Sunday morning.



VF

6a. According to the graph, which statements are correct?

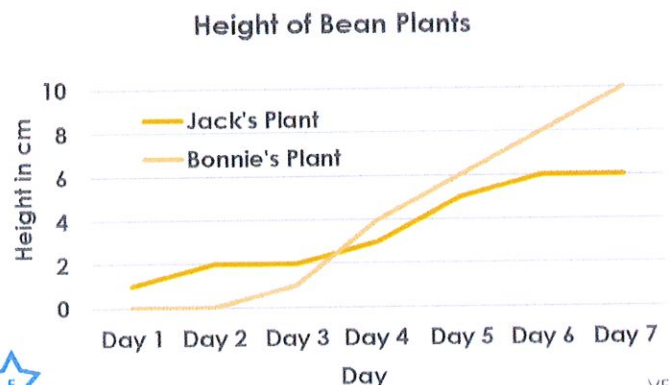
- A. Both cities had one day with no rain.
- B. Friday was the rainiest day in both cities.



VF

6b. According to the graph, which statements are correct?

- A. Bonnie's bean plant was 4cm taller than Jack's on Day 7.
- B. Jack's bean plant grew 1cm between Day 5 and Day 7.



VF

Read and Interpret Line Graphs

Read and Interpret Line Graphs

7a. Complete the table by giving an example of data that can be represented by each of the graphs or charts below.

Line Graph	
Bar Chart	

7b. Complete the table by giving an example of data that can be represented by each of the graphs or charts below.

Line Graph	
Tally Chart	



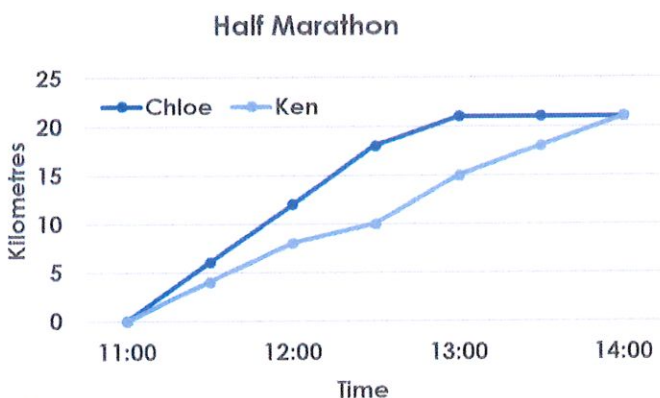
VF



VF

8a. True or false?

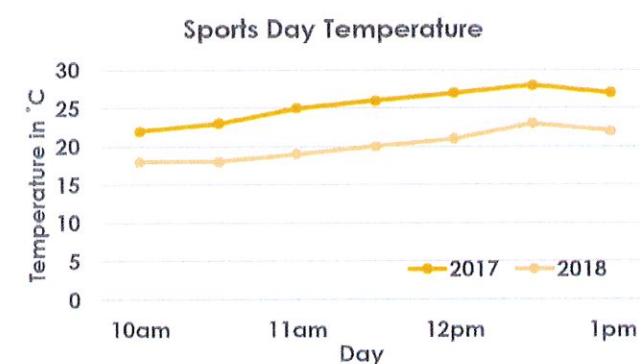
Both friends finished the half marathon (21km) by 1:30pm.



VF

8b. True or false?

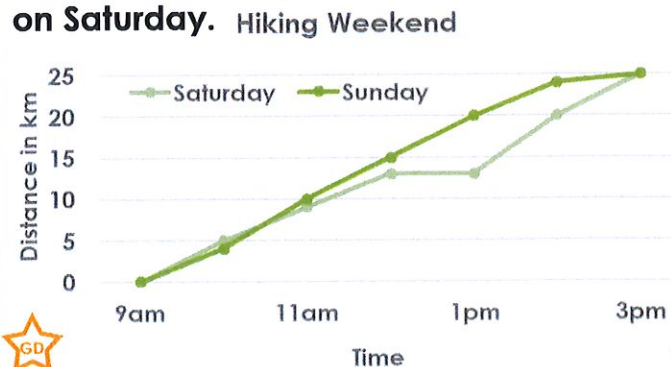
12:30pm was the warmest time during sports day in 2017 and 2019.



VF

9a. According to the graph, which statements are correct?

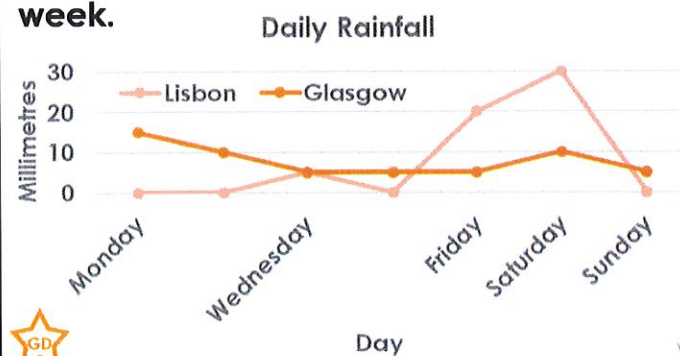
- A. On Sunday, the hiker walked quickest after 2pm.
- B. The hiker had walked 5km by 10am on Saturday.
- C. The hiker stopped for a break at 12pm on Saturday.



VF

9b. According to the graph, which statements are correct?

- A. Lisbon and Glasgow both had 5mm of rain on Wednesday.
- B. There was heavy rain in Glasgow on Friday.
- C. Lisbon had four days without rain this week.



VF

Varied Fluency
Read and Interpret Graphs

Developing

- 1a. **A**
- 2a. **False, it rained from 11am to 5pm.**
- 3a. **A is correct.**

Expected

- 4a. **B and C**
- 5a. **False, Amir won the race.**
- 6a. **B is correct.**

Greater Depth

- 7a. **Various answers, for example:**
Line graph = weight of a baby measured on the same day every month for a year.
Bar chart = number of children in class born on different days of the week.
- 8a. **False as Ken still has 3km to run.**
- 9a. **B and C are correct.**

Varied Fluency
Read and Interpret Graphs

Developing

- 1b. **A**
- 2b. **False, the bean plant grew to 8cm.**
- 3b. **B is correct.**

Expected

- 4b. **A and B**
- 5b. **True, Donna turns the heating on at about 10am.**
- 6b. **Both statements are correct.**

Greater Depth

- 7b. **Various answers, for example:**
Line graph = number of people in a shop throughout the day.
Tally chart = types of vehicles on the car park.
- 8b. **True**
- 9b. **A and C are correct.**

Read and Interpret Line Graphs

Read and Interpret Line Graphs

1a. Carrie is recording the amount of milk left in the jug in her fridge throughout the week. Which graph most likely shows her data? Explain how you know.

A

B

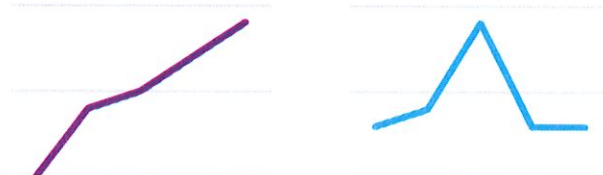


R

1b. Derrik is recording how many Easter presents his store sells during and after Easter weekend. Which graph most likely shows his data? Explain how you know.

A

B



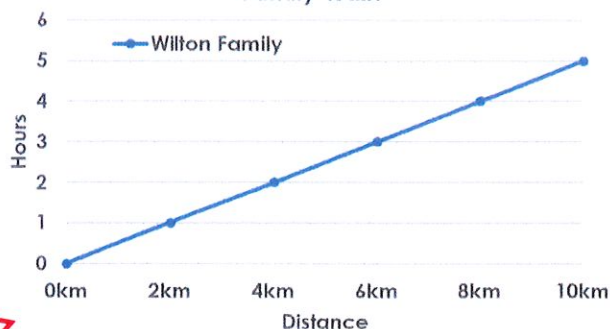
R

2a. Anton and Lea are interpreting this graph. Anton says, "It took the family 5 hours to walk 10 kilometres."

Lea says, "The family had a break after walking for 3 hours."

Who is correct? Explain.

Family Walk



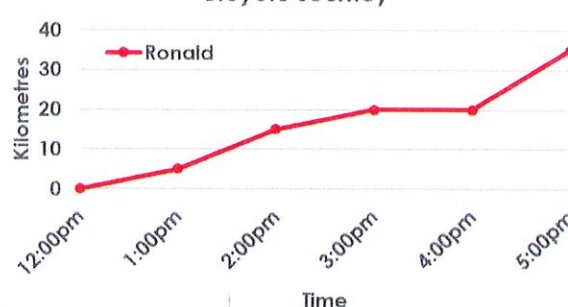
R

2b. Peter and Nora are interpreting this graph. Peter says, "Ronald travelled 20 kilometres between 3:00pm and 4:00pm."

Nora says, "Ronald stopped between 3:00pm and 4:00pm."

Who is correct? Explain.

Bicycle Journey



R

3a. Caring Cards Company earns £100 profit for every 100 cards sold. How much did they profit from Mother's Day cards? Why did sales drop so quickly on Monday?

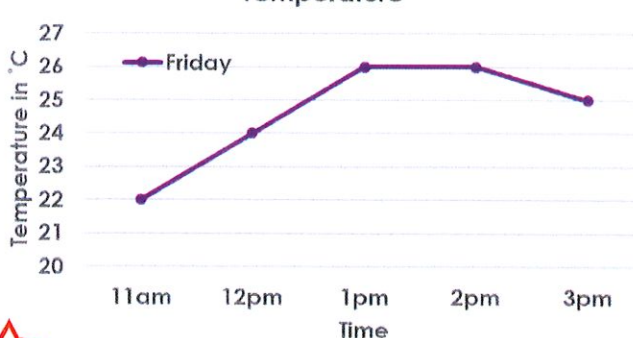
Mother's Day Card Sales



PS

3b. Lori is tracking the temperature throughout the day. She must drink a bottle of water per hour when it's 24°C or hotter. How many bottles of water will she drink?

Temperature



PS

Read and Interpret Line Graphs

Read and Interpret Line Graphs

4a. The health visitor is recording the height of twins during their first year. Which graph most likely shows her data? Explain how you know.

A

B



R

4b. Jim is recording the temperature from September to January in London and Sydney. Which graph most likely shows his data? Explain how you know.

A

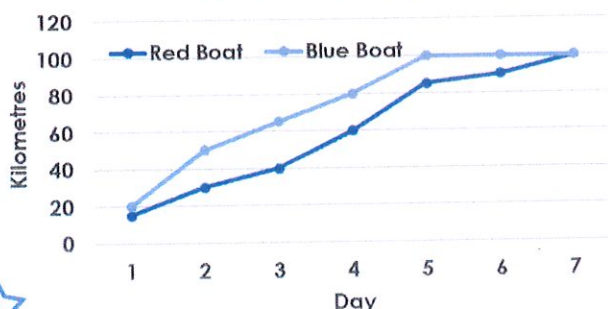
B



R

5a. Yulia and Naveed are interpreting a graph. Yulia says, "The blue boat reached their destination on Day 5." Naveed says, "The red boat travelled 100km between Day 6 and Day 7." Who is correct? Explain.

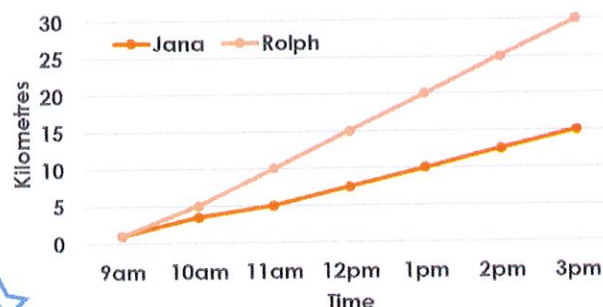
Distance Travelled



R

5b. Nico and Harriet are interpreting a graph. Nico says, "Rolph's journey was steeper because his line is steeper on the graph." Harriet says, "Jana travelled much slower; her climb could have been more difficult." Who is correct? Explain.

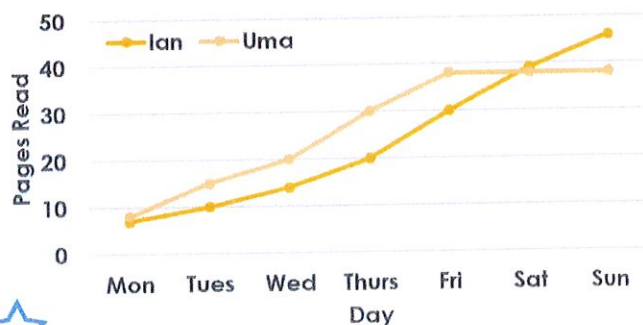
Hill Climb



R

6a. Every Friday, Ian and Uma's teacher gives a sticker for every multiple of 10 pages they read. Who received the most stickers this week? Who read the most pages in total? Why did Uma stop reading on Friday?

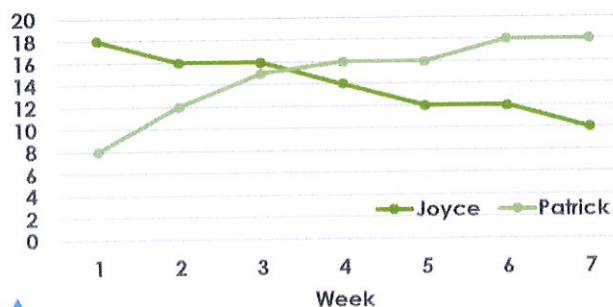
Reading Records



PS

6b. Joyce and Patrick each earn one point for their class every time they score more than 15 on a spelling quiz. How many points will they each earn this half term? Who has shown improvement?

Spelling Quiz Scores



PS

Read and Interpret Line Graphs

Read and Interpret Line Graphs

7a. Write your own story to match the data in the two graphs below.

A

B



R

7b. Write your own story to match the data in the two graphs below.

A

B



R

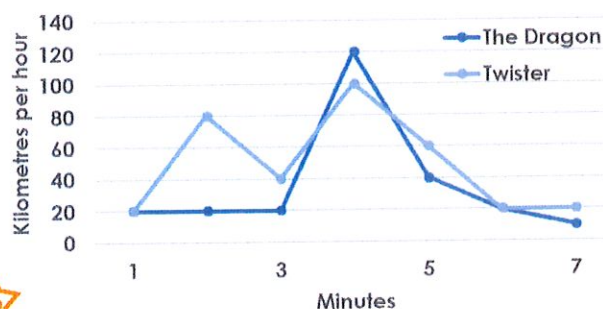
8a. Fazir and May are interpreting a graph.

Fazir says, "The Dragon has a rapid increase in speed at 3 minutes."

May says, "The Twister goes the fastest."

Who is correct? Explain.

Speed of Roller Coaster



R

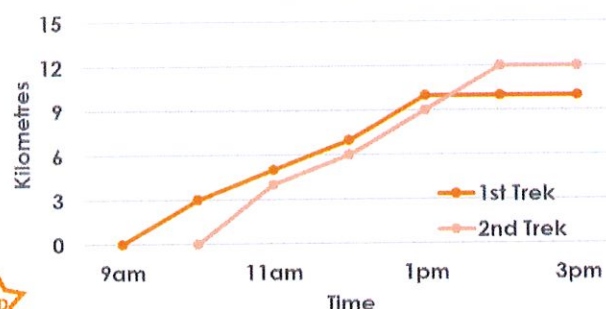
8b. Nancy and Quinn are interpreting a graph.

Nancy says, "Both treks started at 9am."

Quinn says, "The 2nd trek was the longest by 2km."

Who is correct? Explain.

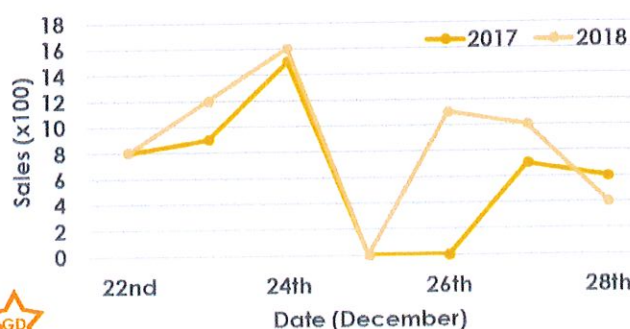
Trekking



R

9a. Carl's Cards makes it's biggest profit in the holiday season. What date is the shop closed for business? If the shop earns £200 for every 100 cards sold, which year made the biggest profit?

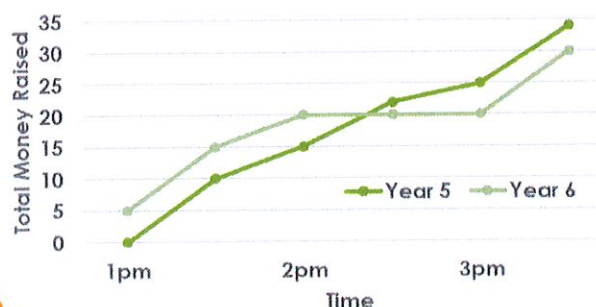
Christmas Card Sales



PS

9b. Years 5 and 6 are holding a fundraiser for charity. For every £1 raised, the school is giving an extra £2 to the same charity. How much money did each year group raise in total?

Fundraising



PS

Reasoning and Problem Solving Read and Interpret Graphs

Developing

- 1a. B shows her data, because the amount of milk would decrease throughout the week.
- 2a. Anton is correct. The graph does not show that the family stopped hiking after 3 hours.
- 3a. They made £2,300 profit on cards. Sales dropped because Mother's Day happened on Sunday, and not as many people needed to buy cards after Mother's Day.

Expected

- 4a. A shows her data because the twins would gain in height but at slightly different rates. B suggests that the height of one twin decreases over time.
- 5a. Yulia is correct because the blue boat stopped travelling on Day 5. The red boat travelled 100km in total, not in one day.
- 6a. Ian gets the most stickers. Ian read more pages in total (looking at Saturday and Sunday). Uma could have finished her book on Friday.

Greater Depth

- 7a. Various answers, for example:
A = Two runners travelling the same route and over the same terrain but one is faster than the other.
B = The temperature of two cities in the UK recorded from Summer to Autumn.
- 8a. Fazir is correct. The Dragon also goes 20km/hour faster than The Twister, so it is the fastest ride.
- 9a. The shop is closed on Christmas Day. The biggest profit was made in 2018 (£12,200).

Reasoning and Problem Solving Read and Interpret Graphs

Developing

- 1b. B shows his data, because sales for Easter related gifts would not continue increasing after Easter weekend.
- 2b. Nora is correct. The graph shows that Ronald did not travel between 3 and 4pm.
- 3b. She will drink 3 bottles of water (1 between 12pm – 1pm, 1 between 1pm – 2pm and 1 between 2pm – 3pm). She may start another at 3pm as the temperature is still 24°C at 3pm.

Expected

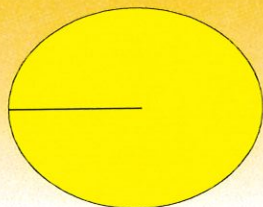
- 4b. B shows his data because the temperature in London will be getting colder over those months, whilst it will be getting warmer in Sydney.
- 5b. Harriet is correct, that is one reason why Jana travelled a much shorter distance in the same amount of time. Nico has misinterpreted what the graph is showing; the incline of the hike is not related to the angle of the line.
- 6b. Joyce will earn 3 points and Patrick will earn 4 points this half term. Patrick has shown steady improvement in his quizzes, while Joyce's scores keep going down.

Greater Depth

- 7b. Various answers, for example:
A = Two vehicles starting off and travelling the same distance but at different speeds before slowing down again.
B = Two plants growing over the same time period. One plant continues to grow, whilst the other stops get any taller.
- 8b. Quinn is correct. The second trek started at 10am.
- 9b. Year 5 raised £34 and Year 6 raised £30. With the school's contribution, Year 5 raised £102 and Year 6 raised £90.

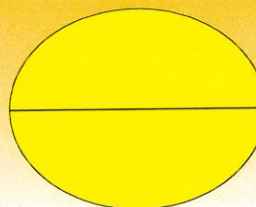
Radius

The radius is a line that runs from the centre of the circle to the edge of the circle.

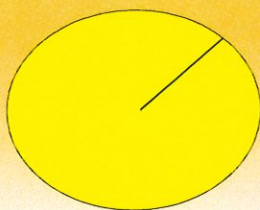
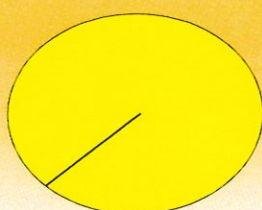


Diameter

The diameter is a line that runs from one side of the circle to the other side, passing the centre on its way.

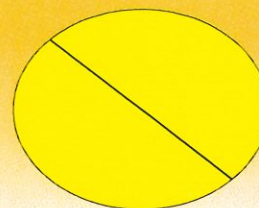
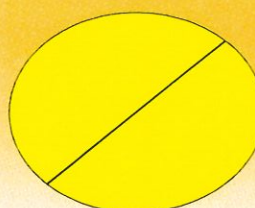


These can be drawn in different ways:



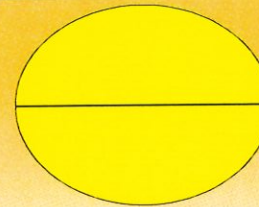
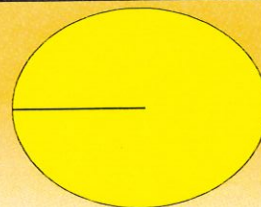
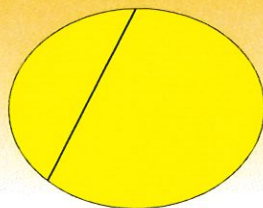
Why do these both still show the radius of the circle?

These can be drawn in different ways:



Why do these both still show the diameter of the circle?

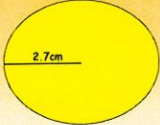
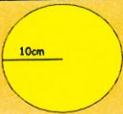
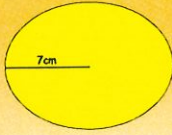
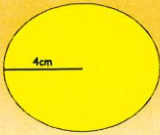
Does this line represent the diameter of the circle? Why/ why not?



If we know the radius, we can calculate the diameter by _____.

If we know the diameter, we can calculate the radius by _____.

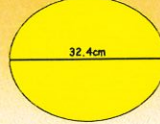
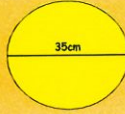
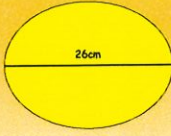
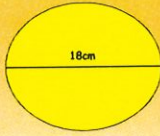
Work out the diameter of each circle:



Radius $\times 2$ = Diameter

Why can you always double the radius to work out the diameter? When might it go wrong?

Work out the diameter of each circle:



Diameter $\div 2$ = Radius

Why can you always half the diameter to work out the radius? When might it go wrong?

A bicycle wheel has a diameter of 64 cm.

What is the radius of the bicycle wheel?

cm

Properties of circles!

Using the circles on the table, find the radius, diameter and circumference.

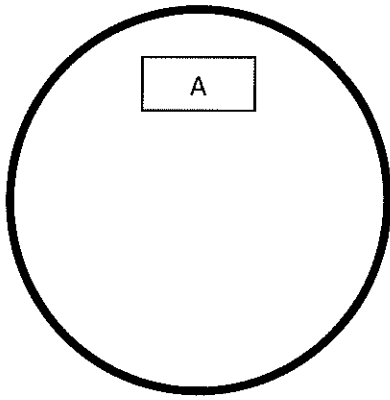
Circles	Radius	Diameter	Circumference
A			
B			
C			
D			
E			

What do you notice about the radius and the diameter?

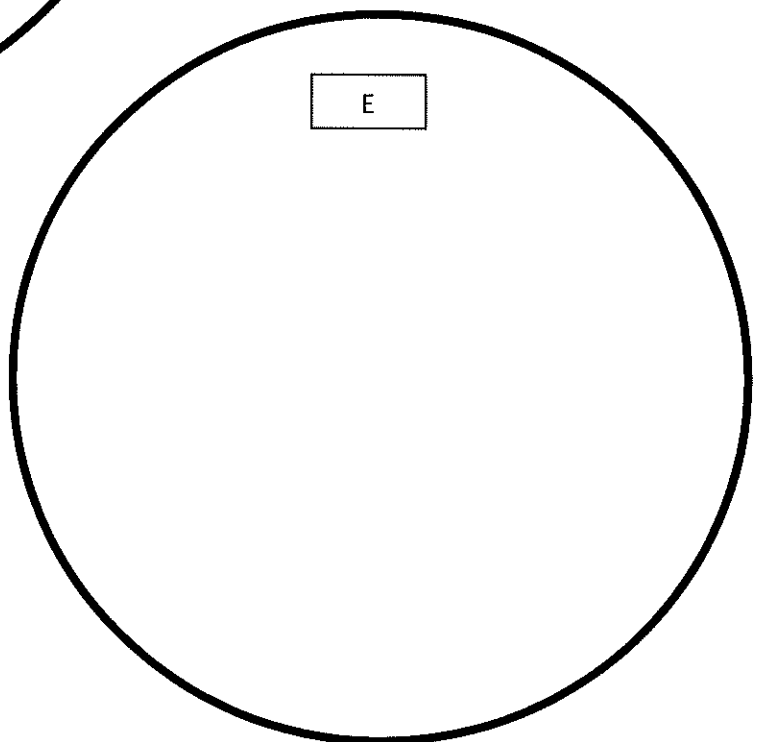
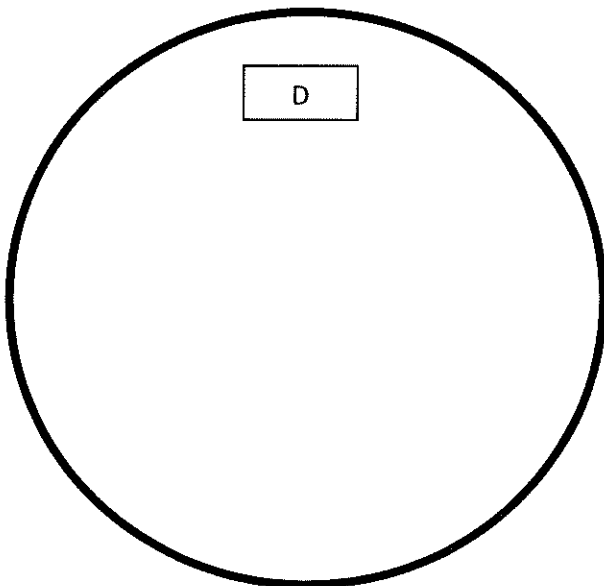
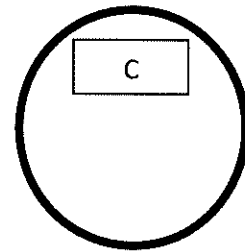
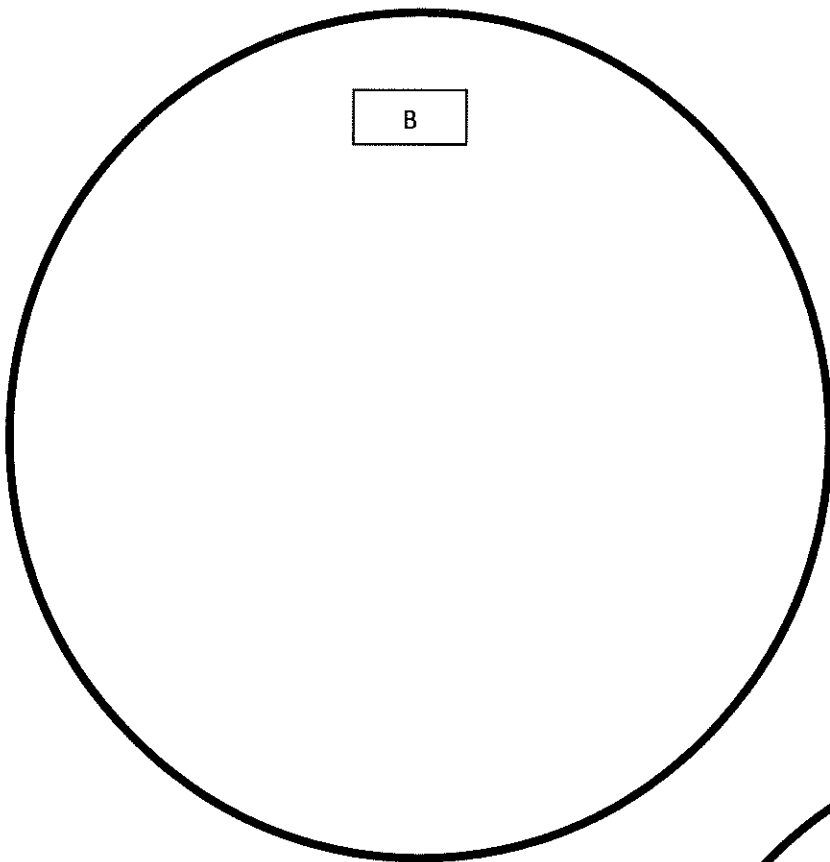
So if a circle has a radius of 20cm, what is the diameter?

So if a circle has a diameter of 56cm, what is the radius?

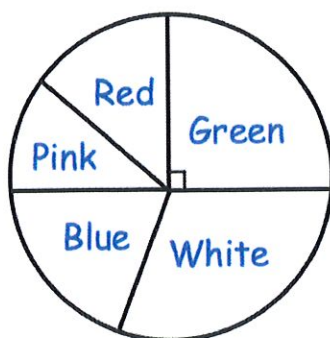
If a tiny circle has a radius of 0.243cm, what is the diameter?



- Cut out your circles
- fold in half
- Fold in half again
- You now have the centre point



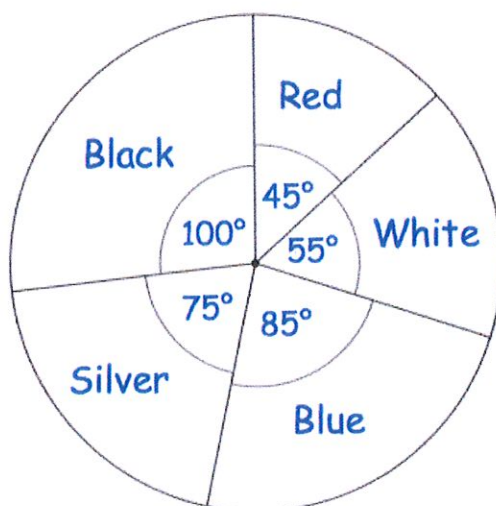
1. The pie chart shows the colours of 32 beads.



How many green beads are there?

.....
(1)

2. The pie chart shows the colours of cars in a car park.



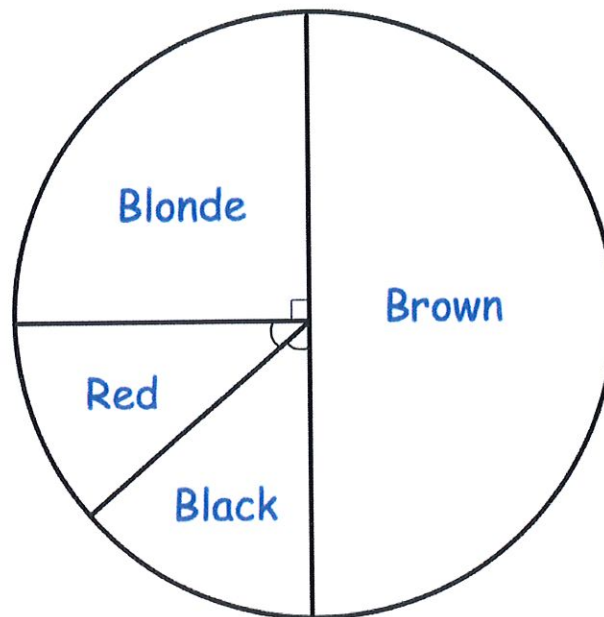
- (a) What is the most common colour of car in the car park?

.....
(1)

- (b) What is the least common colour of car park?

.....
(1)

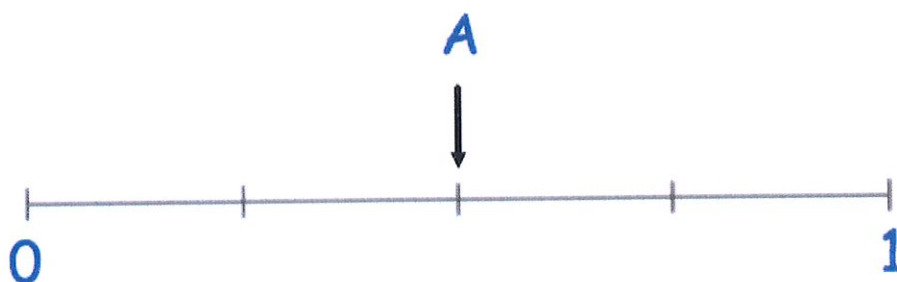
3. The pie chart shows information about the hair colour of the students in a class.



A student from the class is chosen at random.

- (a) Mark, with the letter, the probabilities of each of the following on the scale below.
The first one has been done for you.

- A:** The student has brown hair.
- B:** The student has blonde hair.
- C:** The student has green hair.



(2)

There are 24 students in the class

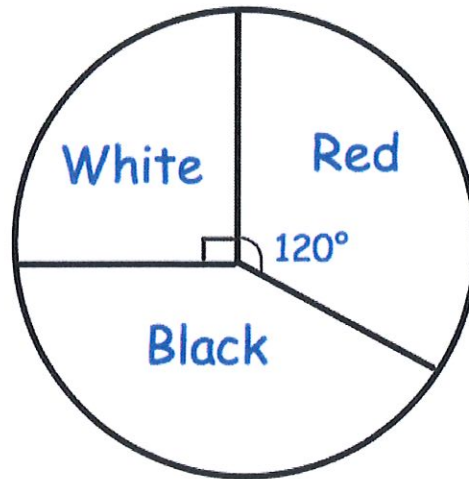
- (b) How many students have blonde hair?

.....
(1)

4. A bag contains red, white and black counters.



The pie chart shows information about the counters in the bag.



- (a) What fraction of the counters are white?
Give your answer in its simplest form.

.....
(2)

- (b) What fraction of the counters are red?
Give your answer in its simplest form.

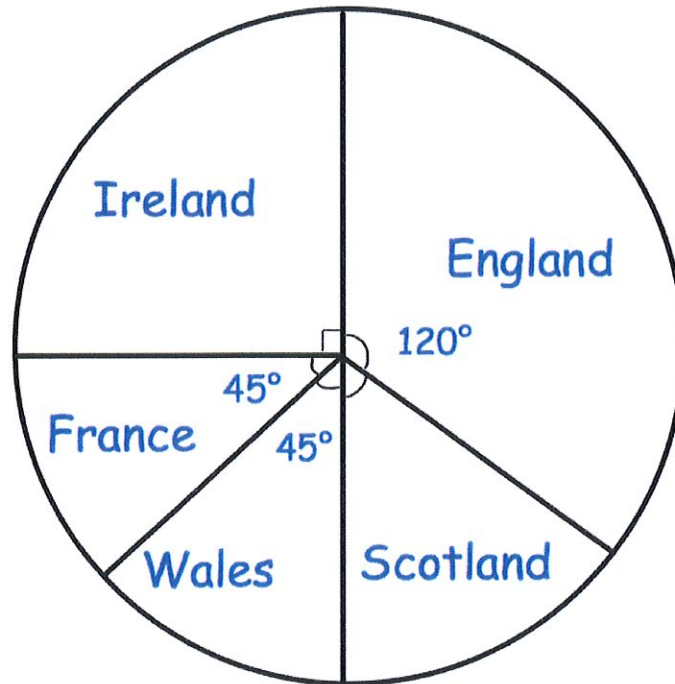
.....
(2)

There are 24 counters in the bag.

- (c) Work out how many counters are black.

.....
(2)

5. A group of rugby fans were asked who they supported.
The pie chart and table show information about who they support.



Use the pie chart to complete the table.

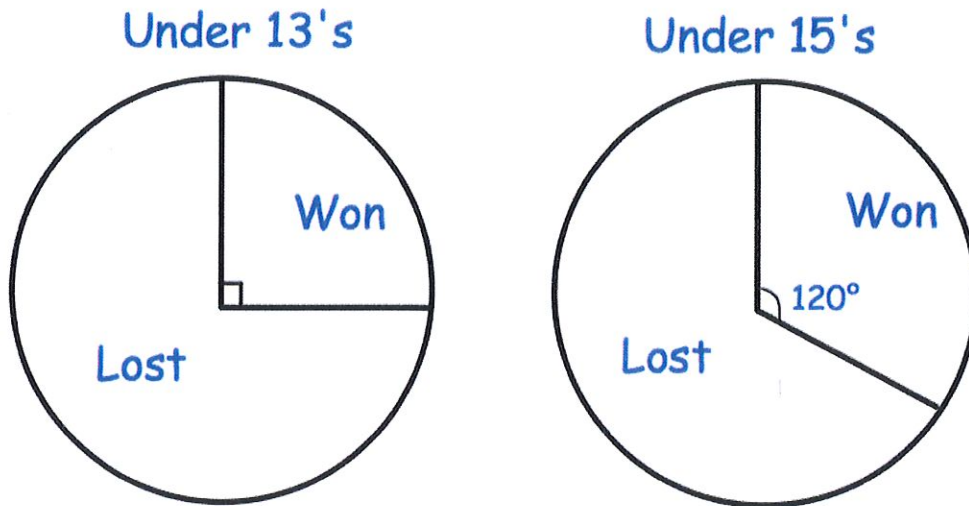
Team	Angle of sector	Number of fans
England	120°	
Scotland		
Wales	45°	
France	45°	
Ireland	90°	12

(4)

6. A youth club has two rugby teams, Under 13's and Under 15's.



The pie charts show information about the number of games each team won and lost, last season.

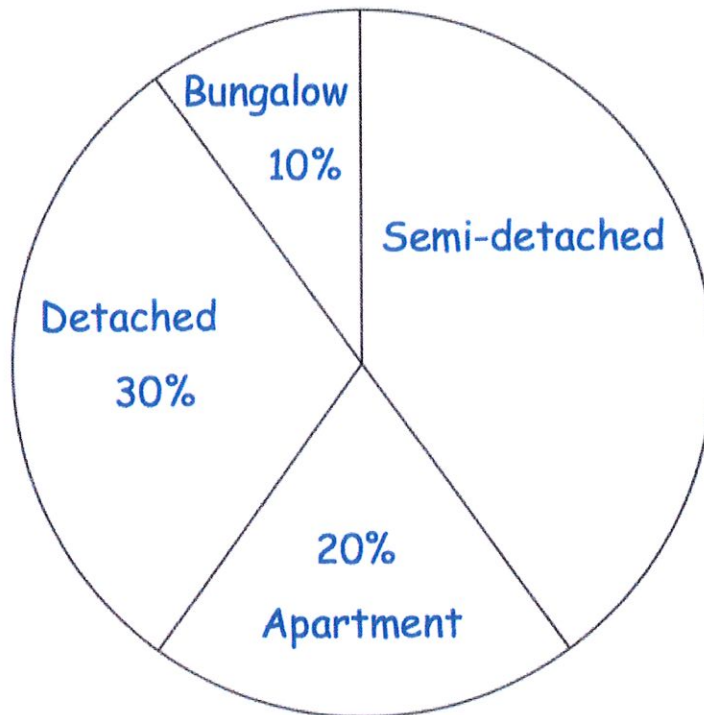


The Under 13's played 28 matches.
The Under 15's played 18 matches.

Which team won more matches?
Show your workings.

.....
(3)

7. The pie chart shows types of properties in a street with 80 properties.



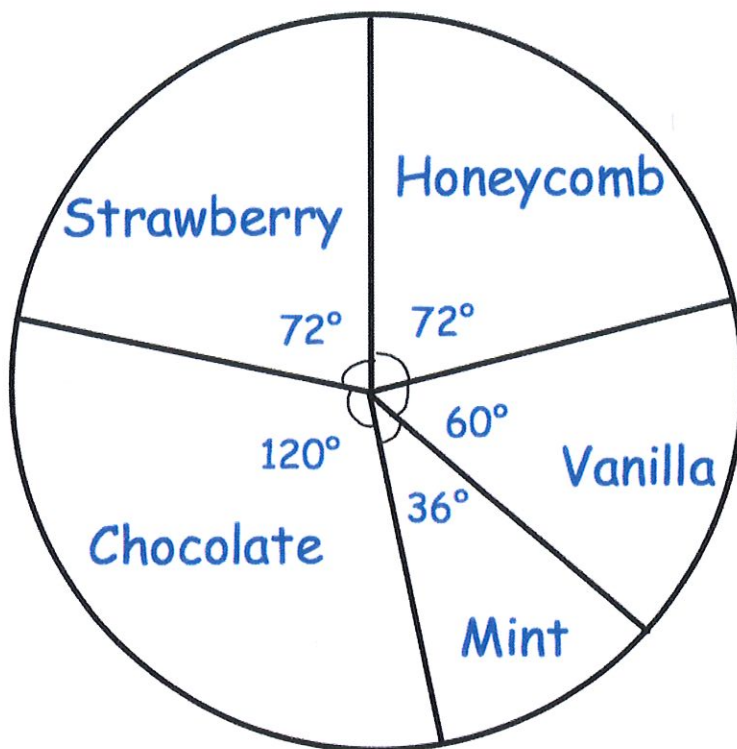
- (a) Work out the percentage of properties that are semi-detached.

.....%
(2)

- (b) Work out the number of semi-detached properties.

.....
(2)

8. The pie chart shows the flavours of ice cream sold by a shop in one day. There were a total of 270 ice creams sold.



- (a) Calculate the number of vanilla flavoured ice creams sold.

.....
(2)

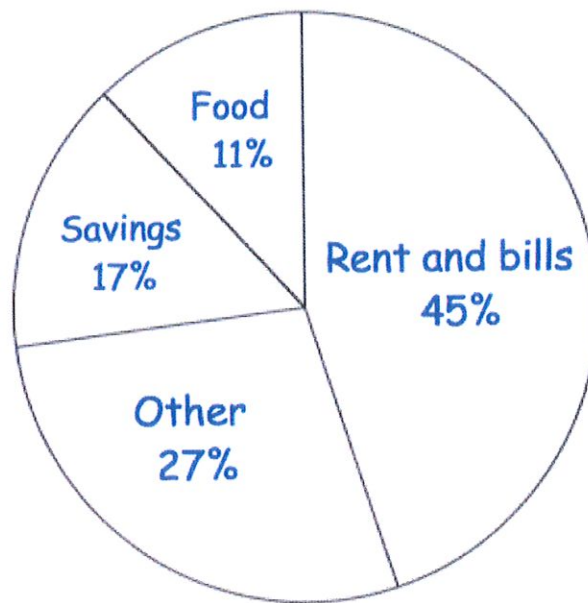
- (b) Calculate the number of mint flavoured ice creams sold.

.....
(2)

- (c) Calculate the number of strawberry flavoured ice creams sold.

.....
(2)

9. The pie chart shows information about how Mr.Jenkins spent his salary for July.

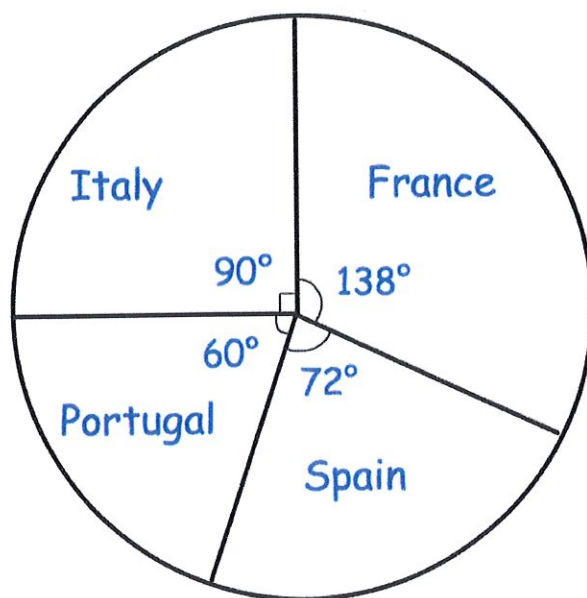


He was paid £2000 in July.

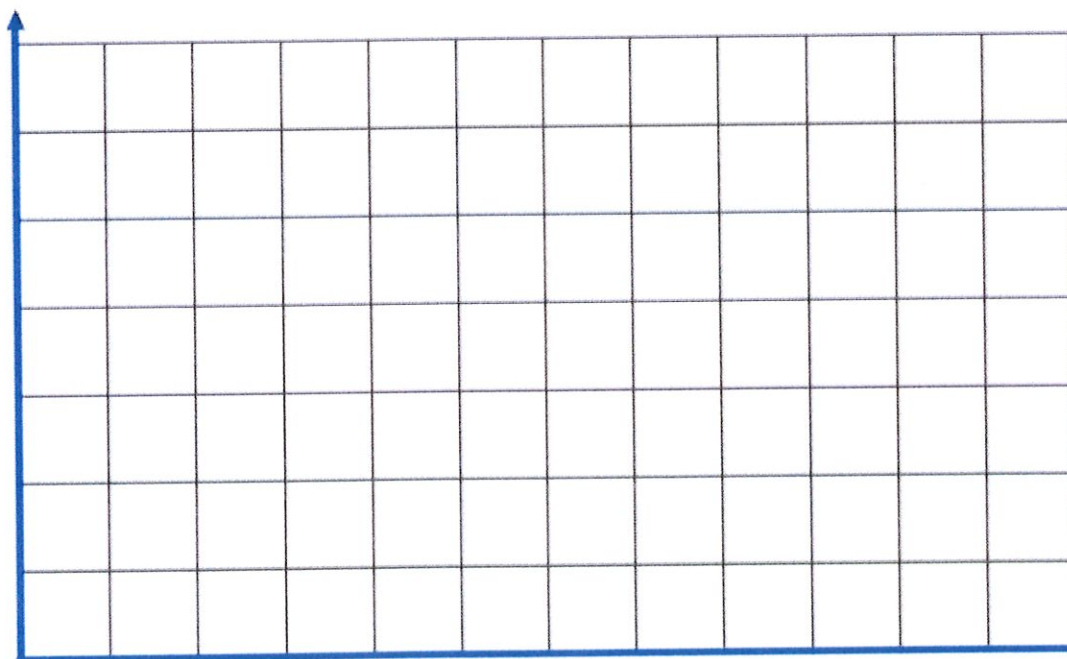
Work out how much Mr.Jenkins spent on rent and bills.

£.....
(2)

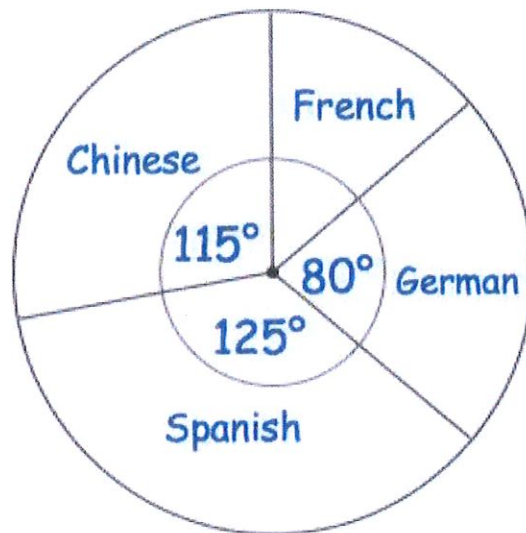
10. The pie chart shows the holiday destinations of 60 people.



Draw a bar chart to represent this information.

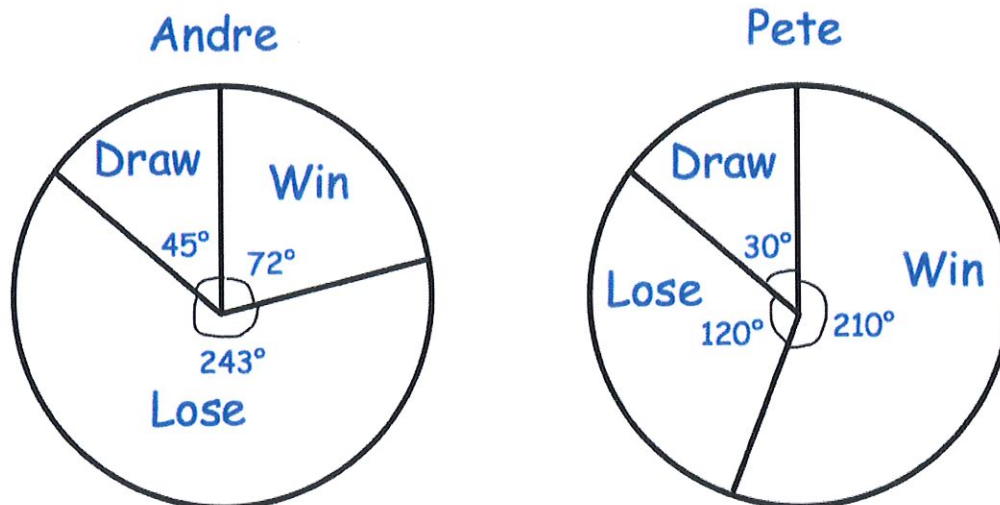


11. The pie chart shows information about the languages studied in a school.
There are 648 students in the school.
Each student studies one language.



How many more students study Chinese than French?

12. The pie charts show information about the results of chess matches that two players have played in over the course of a year.



Andre drew 5 matches.

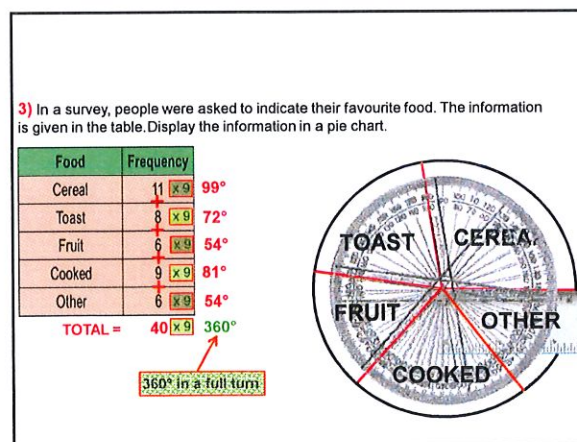
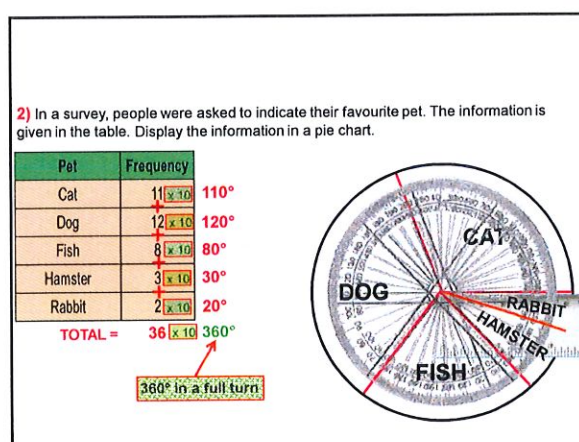
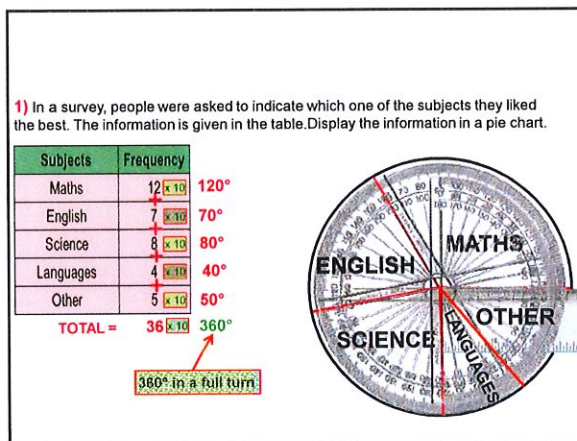
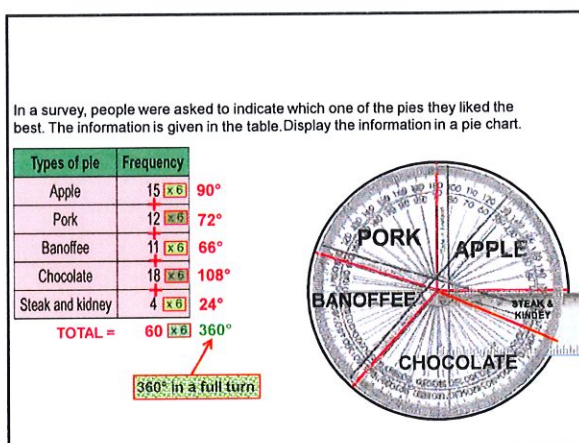
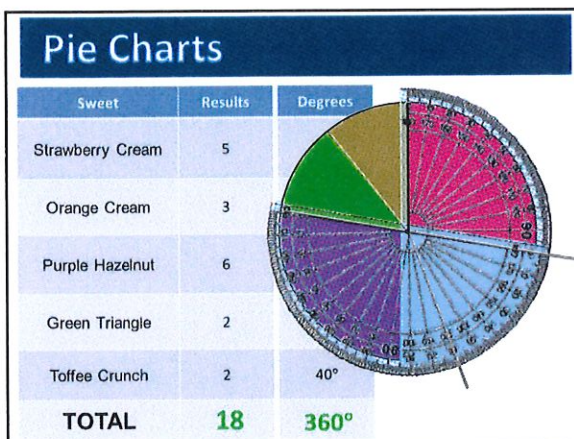
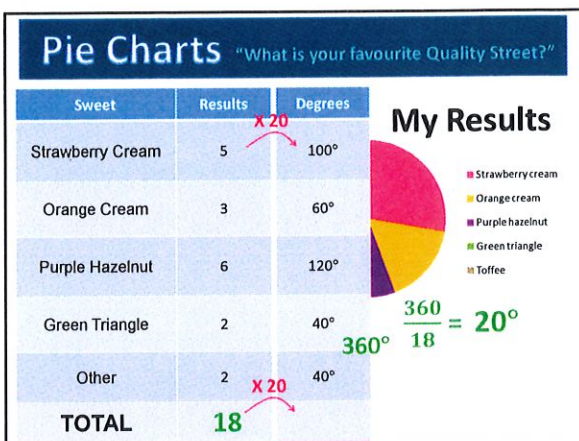
- (a) How many matches did Andre win?

.....
(2)

Edward says "the pie charts show that Pete won more matches than Andre."

- (b) Is Edward correct?
You must explain your answer.

.....
.....
.....
.....
(1)

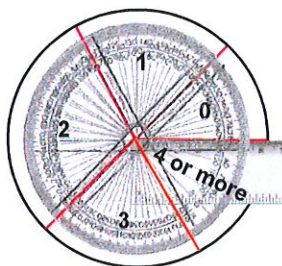


- 4) The table below shows the number of goals scored by an ice hockey team. Display the information in a pie chart.

Goals	Frequency
0	3
1	5
2	7
3	5
4 or more	4

TOTAL = 24

360° in a full turn

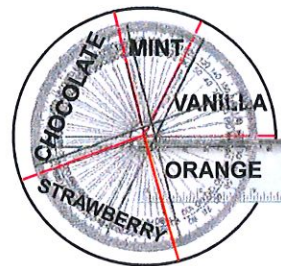


- In a survey, people were asked to indicate which ice cream they liked the best. The information is given in the table. Display the information in a pie chart.

Ice Cream	Frequency
Vanilla	14
Mint	9
Chocolate	21
Strawberry	19
Orange	17

TOTAL = 80

360° in a full turn

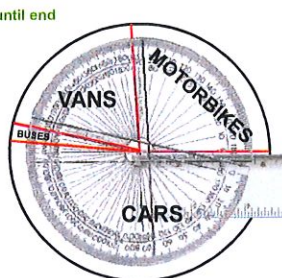


- 1) The table shows the record of traffic travelling down a road in Cleckheaton. Display the information in a pie chart.

Type of Vehicle	Frequency
Cars	140
Motorbikes	70
Vans	55
Buses	5

TOTAL = 270

360° in a full turn

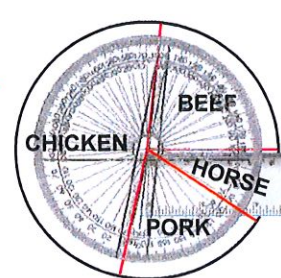


- 2) In a survey, people were asked to name their favourite food. This is shown in the table below. Display the information in a pie chart.

Food	Frequency
Beef	22
Chicken	46
Pork	18
Horse	10

TOTAL = 96

360° in a full turn

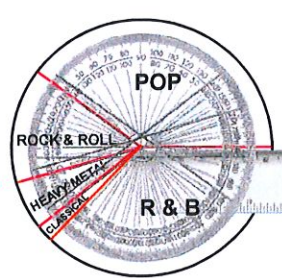


- 3) In a survey, people were asked to name their favourite music. This is shown in the table below. Display the information in a pie chart.

Type of Music	Frequency
Pop	40
Rock & Roll	14
Heavy Metal	6
Classical	2
R & B	38

TOTAL = 100

360° in a full turn

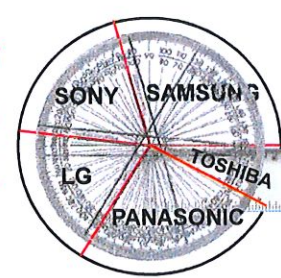


- 4) In a survey, people were asked to name their favourite make of TV. This is shown in the table below. Display the information in a pie chart.

Make of TV	Frequency
Samsung	89
Sony	56
LG	53
Panasonic	78
Toshiba	24

TOTAL = 300

360° in a full turn

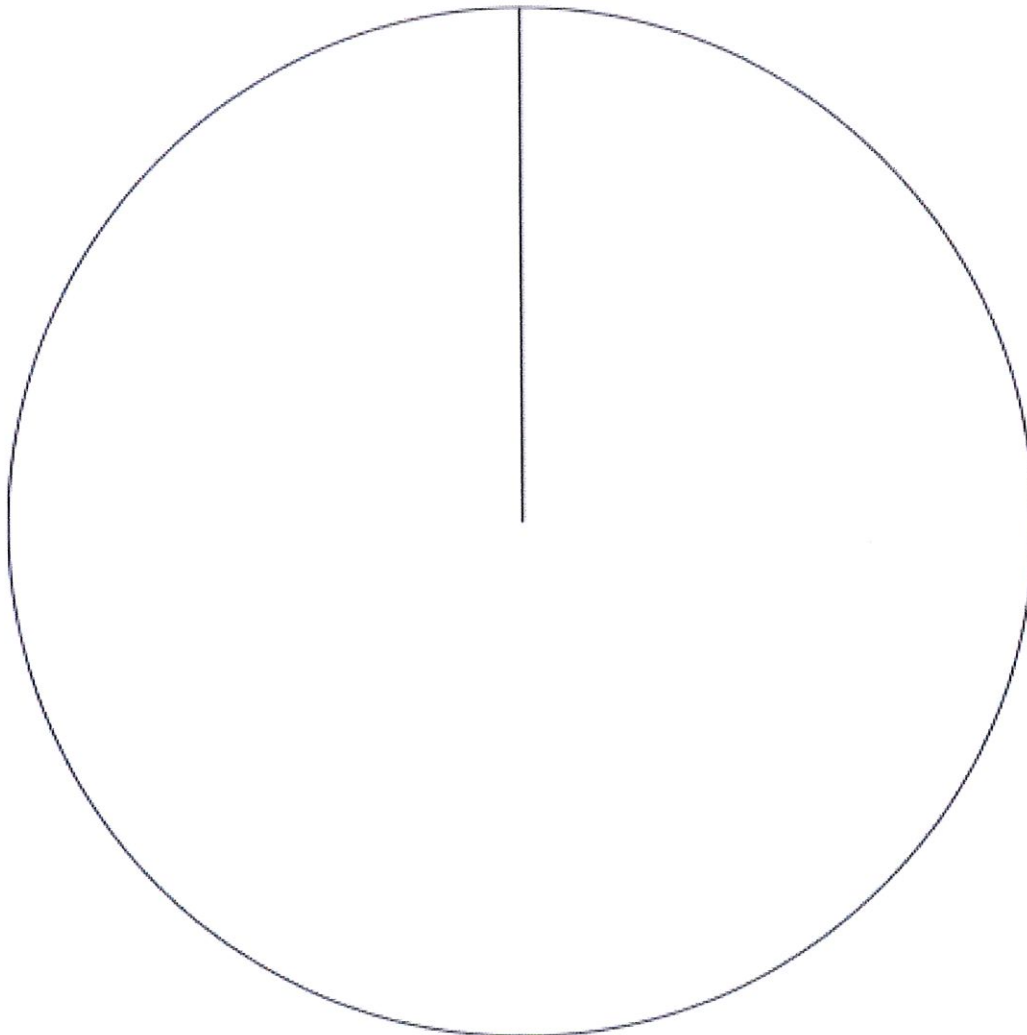


1. The table gives information about the holiday destination of 18 students in a class.



Country	Frequency	
France	3	
Wales	4	
England	11	

Draw an accurate pie chart to show this information.

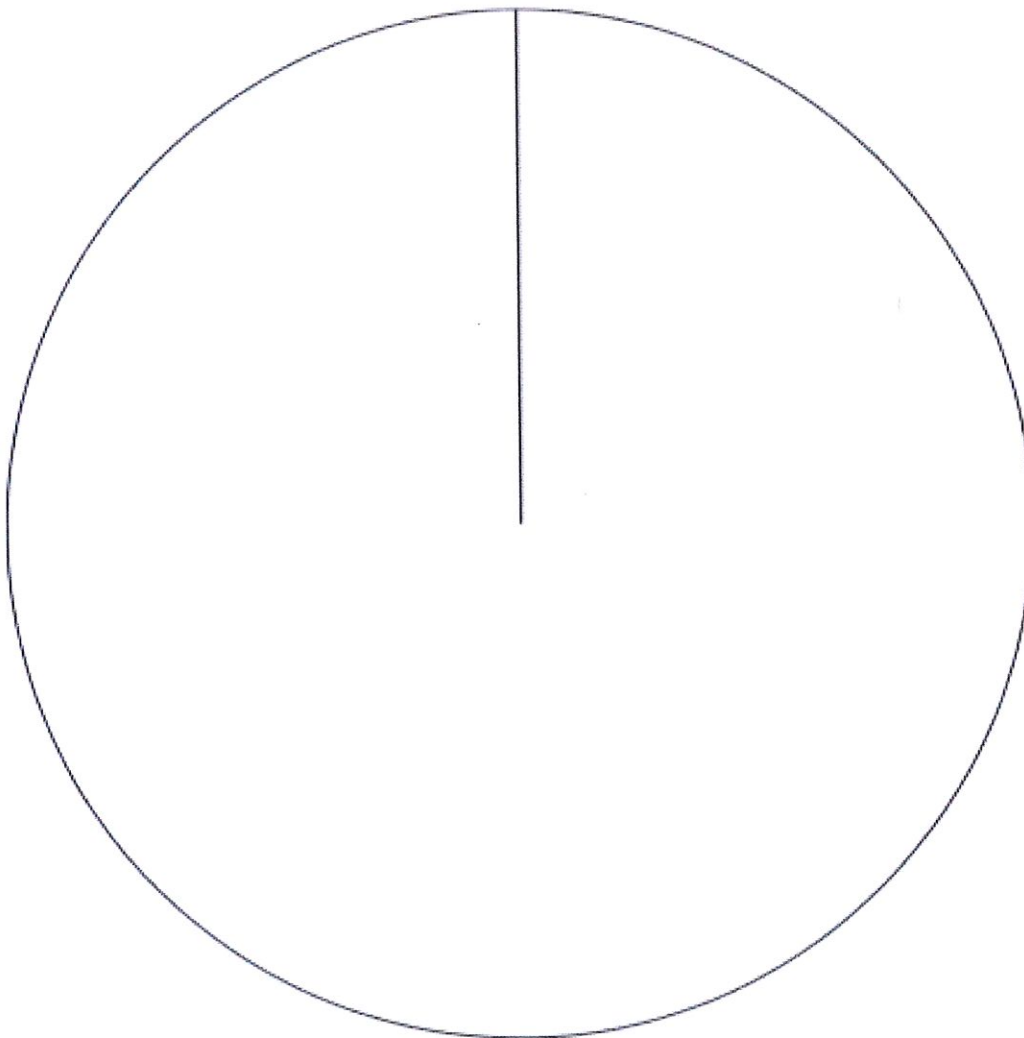


2. The table gives information about the dogs in a village



Breed	Frequency
Spaniel	11
Poodle	7
Greyhound	4
Jack Russell	14

Draw an accurate pie chart to show this information.

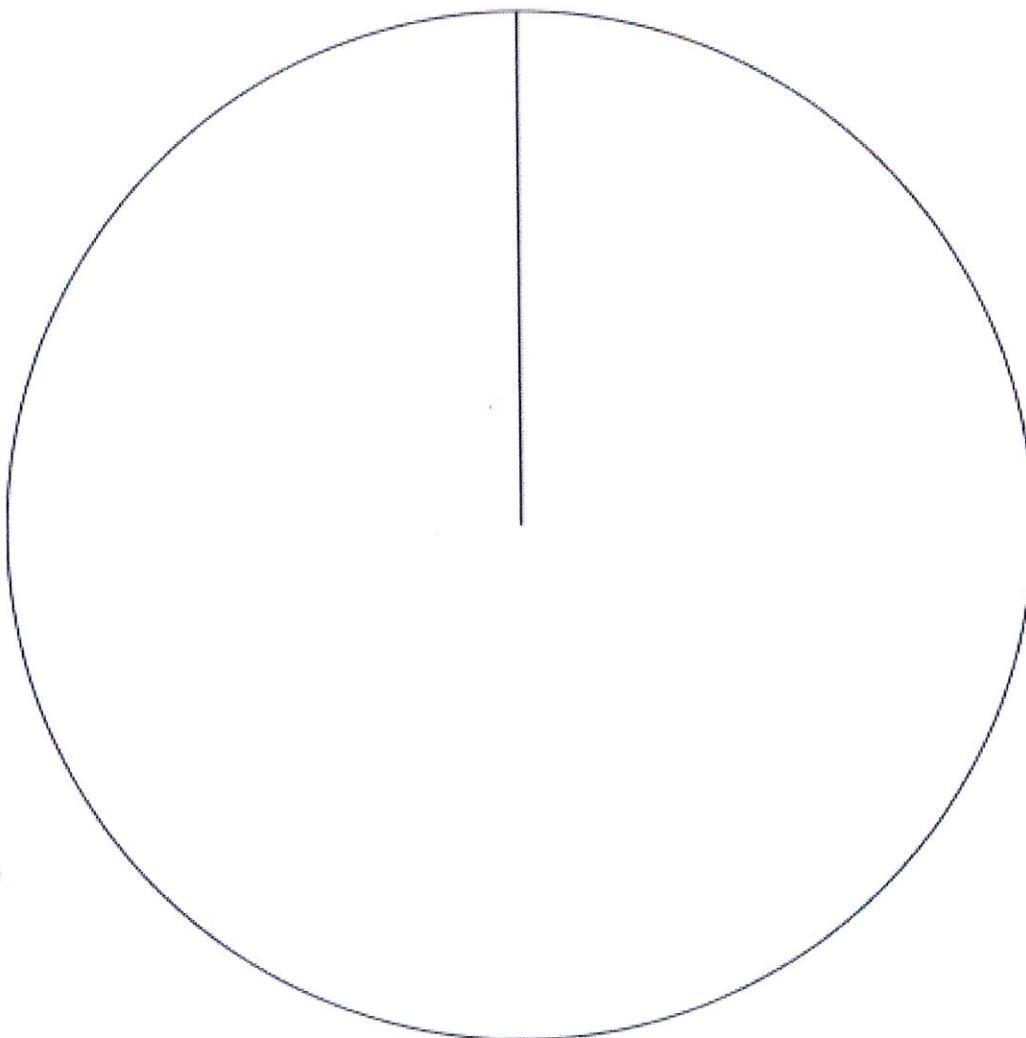


3. The table gives information about students staying after school to play sport.



Sport	Frequency
Netball	15
Hockey	10
Rugby	26
Football	9

Draw an accurate pie chart to show this information.

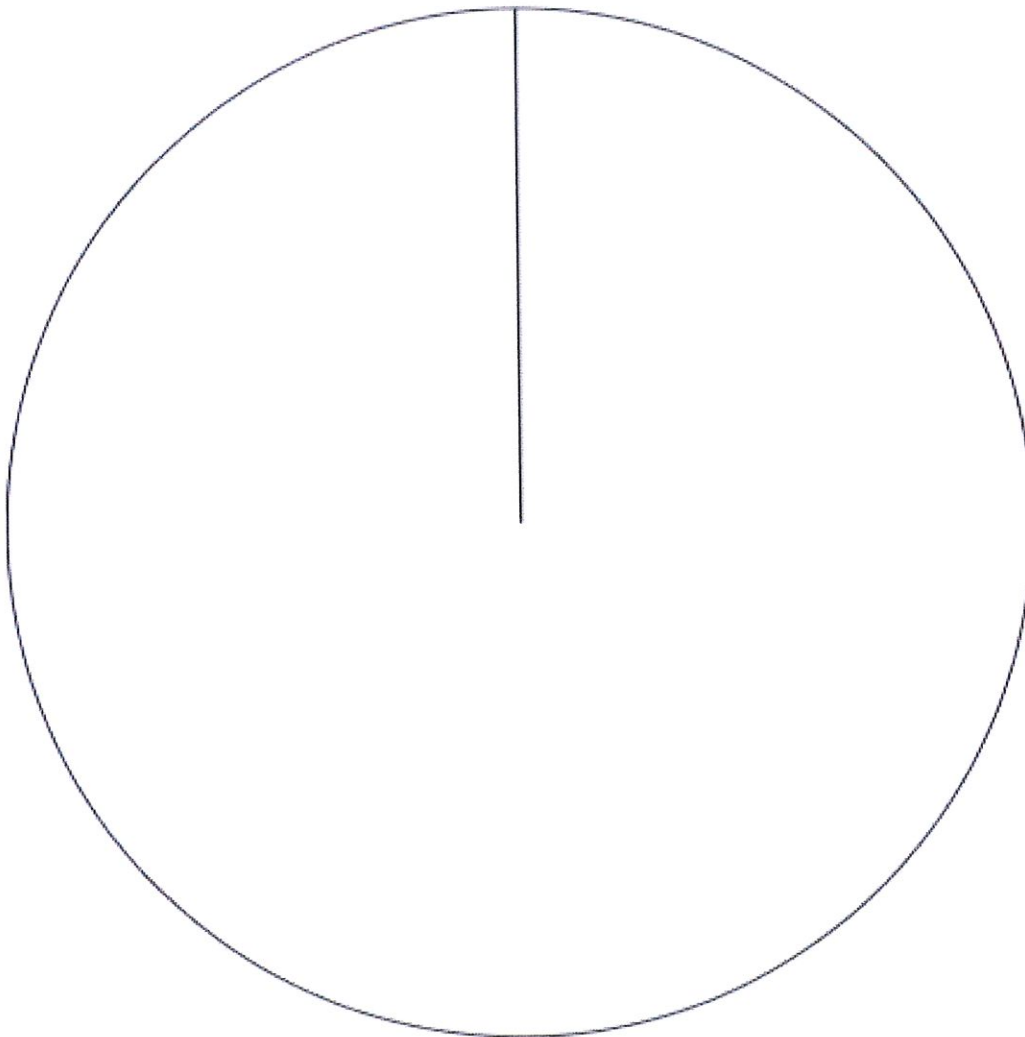


4. The table gives information about the number of students in years 7 to 10.



Year	Frequency
7	200
8	140
9	220
10	160

Draw an accurate pie chart to show this information.



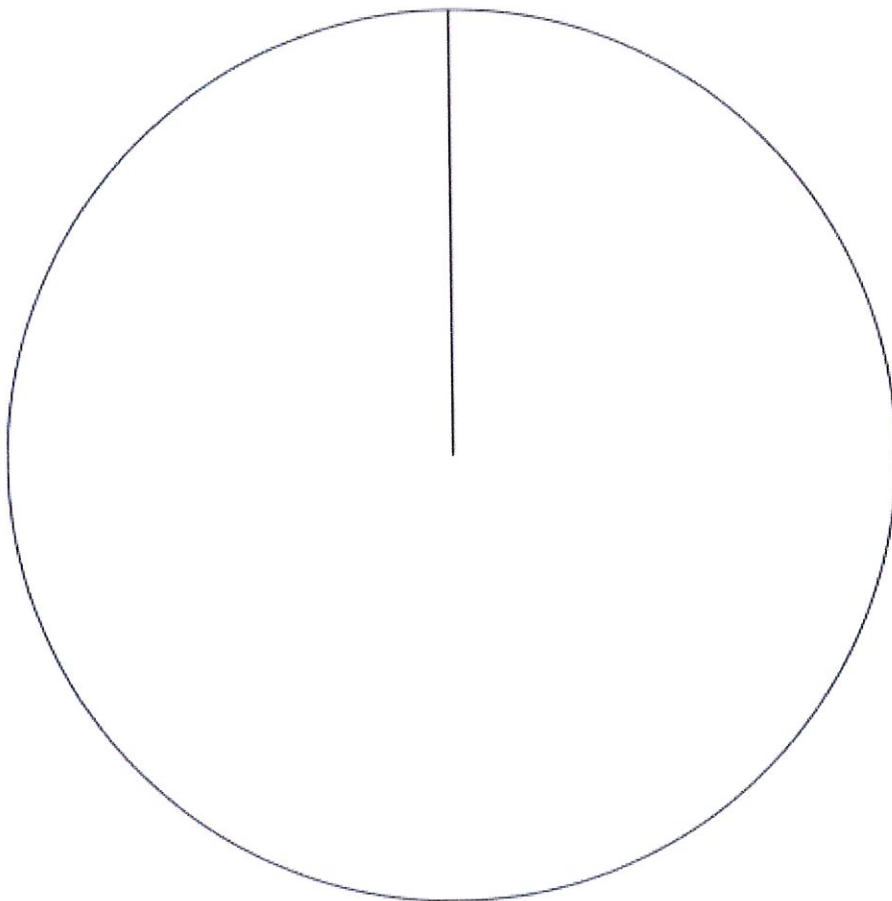
5. Nigel sells bottles of drinks.



The table shows the percentage of drinks sold on a day.

Drink	Percentage
Cola	10%
Water	50%
Lemonade	40%

Draw an accurate pie chart to show this information.



6. How Katie allocates her wages is shown in the table below.

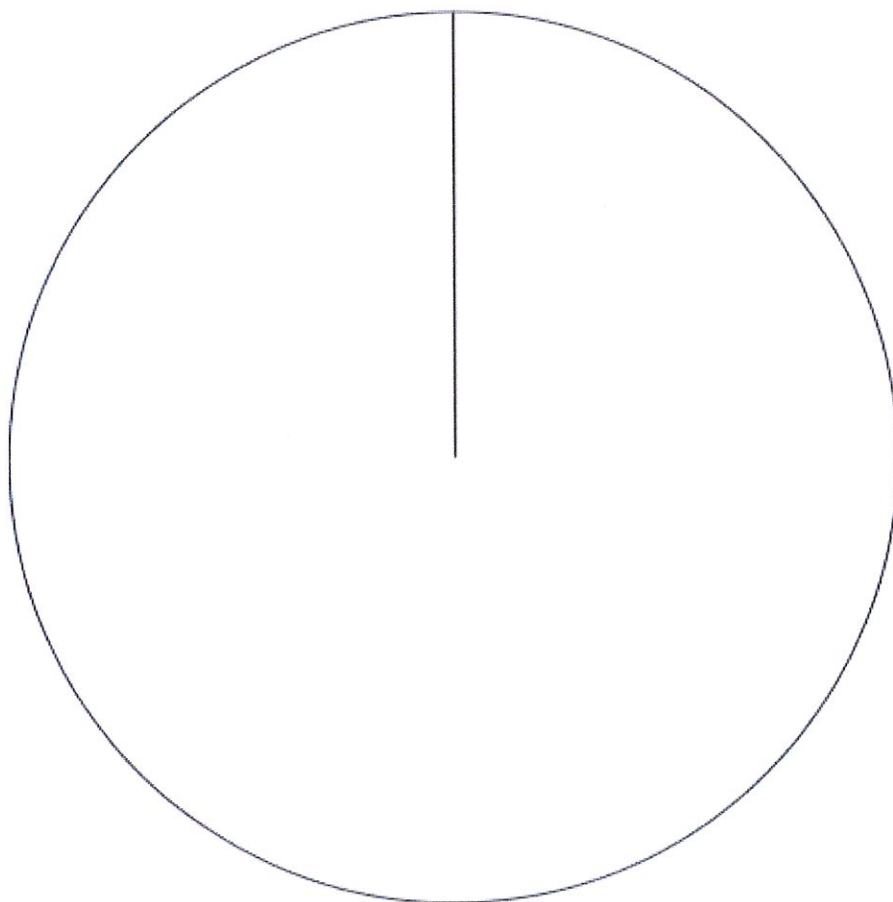


	Percentage	Angle in a pie chart
Rent	25%	
Other spending	45%	
Savings		

- (a) Complete the table.

(3)

- (b) Draw an accurate pie chart to show this information.



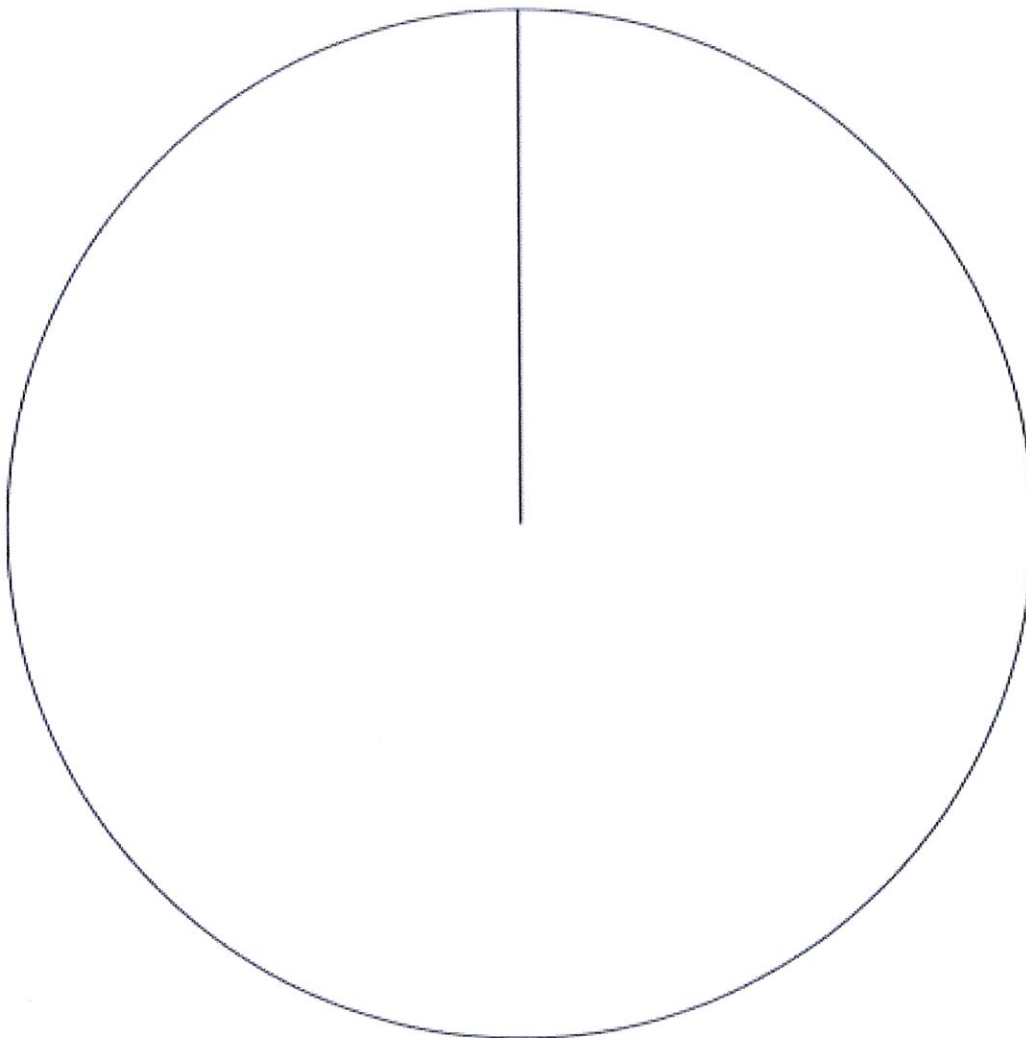
(4)

7. The table gives information about the meals ordered on a Sunday.



Meal	Frequency
Chicken	14
Beef	9
Pork	57
Vegetarian	10

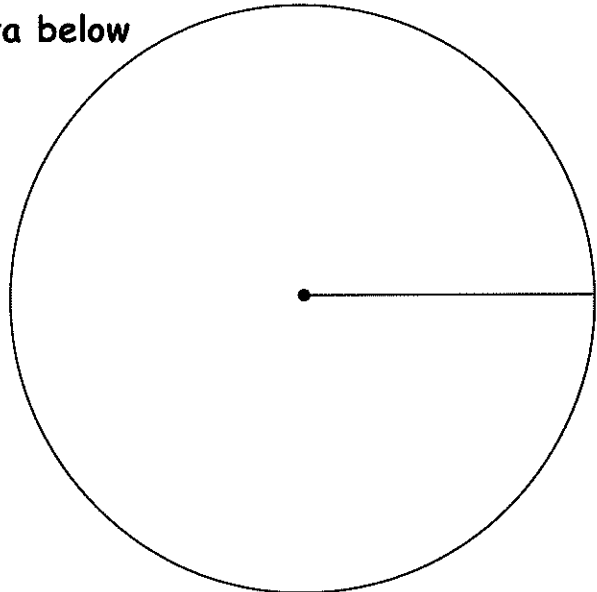
Draw an accurate pie chart to show this information.



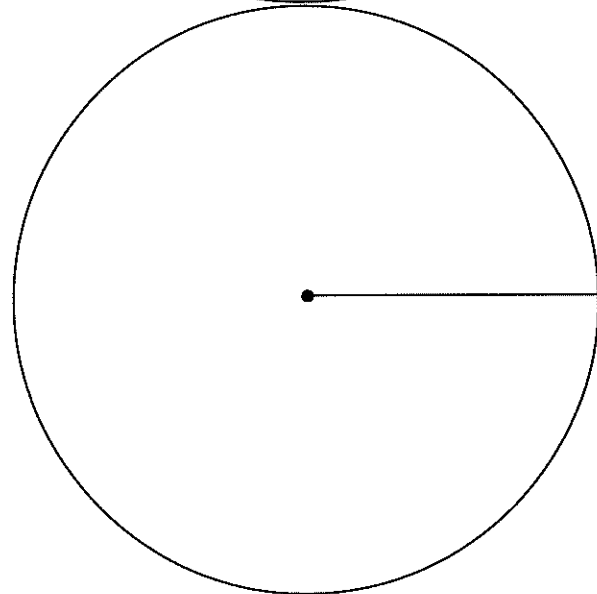
Pie Charts Worksheet

Draw pie charts for each set of data below

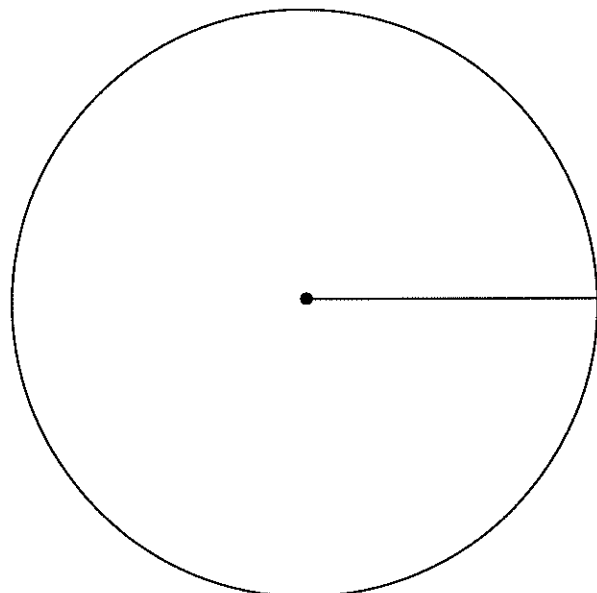
Crisp Sales		
Plain	46	
Chicken	16	
Salt & Vinegar	22	
Cheese & Onion	26	
Smokey Bacon	34	
Total	144	



Ice-cream Sales		
Vanilla	13	
Banana	22	
Chocolate	28	
Strawberry	57	
Total	120	



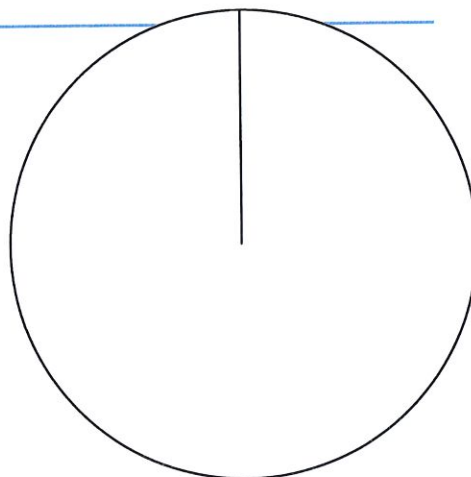
Favourite Sport		
Rugby	75	
Football	90	
Cricket	45	
Ice Hockey	60	
Squash	30	
Total		



Pie Charts

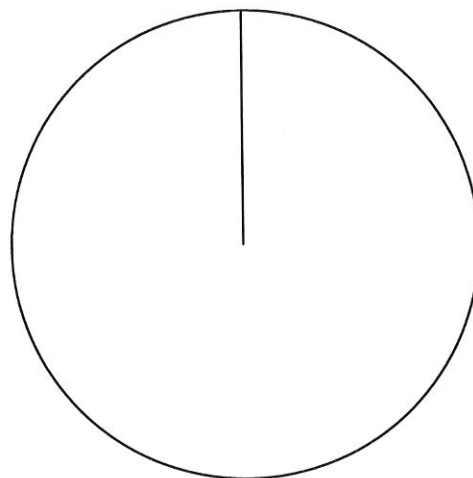
1.

Favourite Footballer	Number of people	Angle
Owen	6	
Giggs	4	
Ferdinand	7	
Fowler	2	
Beckham	5	
Total		



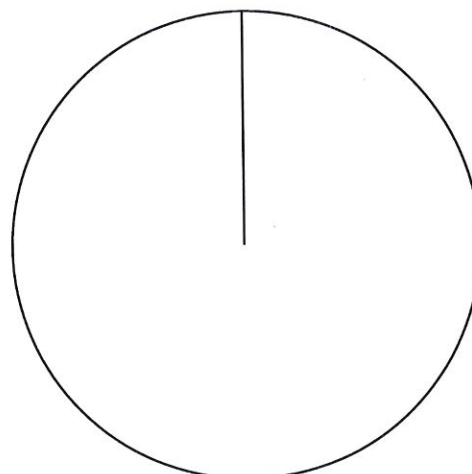
2.

Favourite Sport	Number of people	Angle
Football	25	
Netball	15	
Tennis	30	
Hockey	20	
Total		



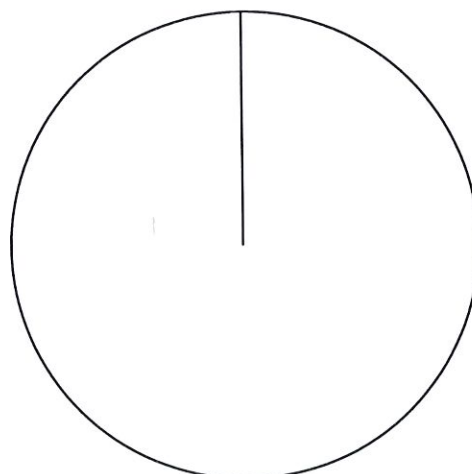
3.

Favourite Food	Number of people	Angle
Chips	21	
Crisps	15	
Cake	6	
Chocolate	14	
Lettuce	4	
Total		



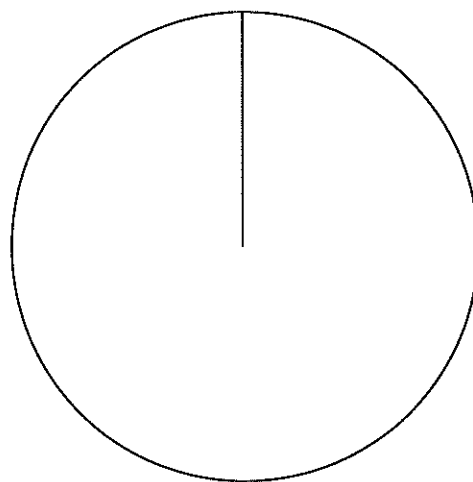
4.

Favourite Pet	Number of people	Angle
Dog	21	
Cat	18	
Fish	4	
Rabbit	2	
Total		



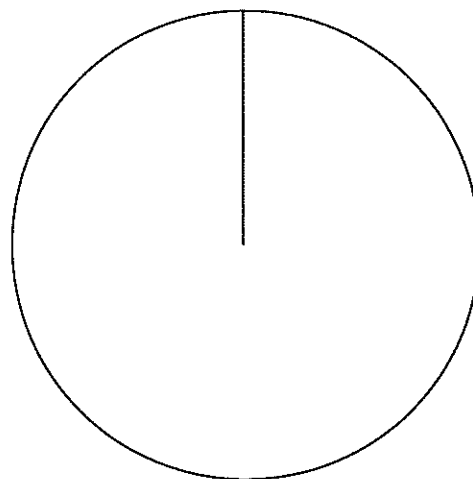
5.

Least liked sport	Number of people	Angle (to the nearest degree)
Football	86	
Netball	45	
Tennis	30	
Hockey	39	
Total		



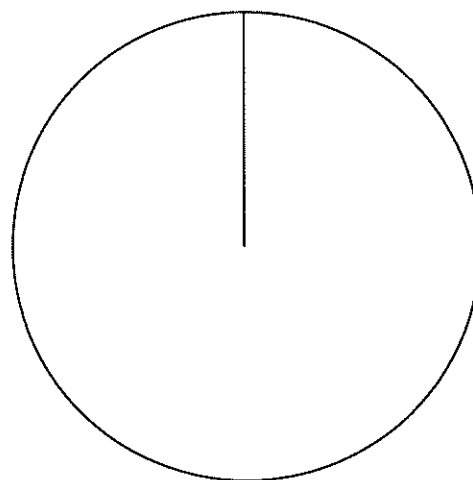
6.

Least liked music	Number of people	Angle (to the nearest degree)
Rock	21	
Jazz	43	
Blues	34	
Pop	2	
Total		



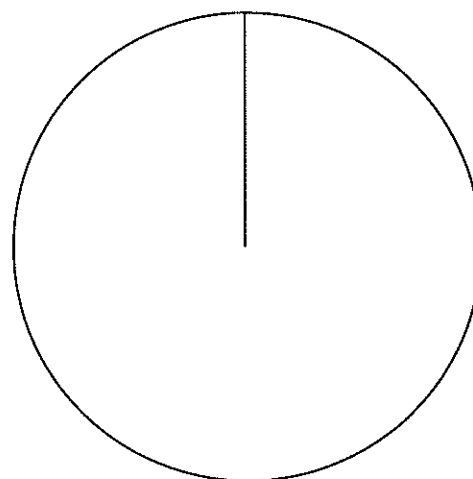
7.

Least liked colour	Number of people	Angle (to the nearest degree)
Blue	137	
Green	64	
Red	23	
Yellow	205	
Purple	3	
Total		



8.

Least liked car	Number of people	Angle (to the nearest degree)
Porsche	8	
Mini	13	
Mondeo	18	
Skoda	35	
Lotus	1	
Total		



Fluency

Find the mean of the following sets of data:

(Add them all up and divide by how many there are)

A. 8, 3, 52, 48, 7, 78

B. 8, 9, 12, 15, 21, 22

C. 24, 27, 21, 25, 28

D. 150, 155, 157, 163, 170

Misconception

Jess thinks that the mean average of these numbers is 7. Do you agree or disagree with her? Show your reasoning.

5, 12, 8, 3, 2, 4, 1

What had Jess done incorrectly to get an answer of 7?

Reasoning

Josie and her brothers and sisters measured their heights and found the mean average. The mean was 150cm. Josie forgot her height. Can you work out the missing height?

150cm, 170cm, 140cm, 155cm, _____

Keywords

Data – pieces of information.

Mean – all of the values added together and then divided by the total number of values.

Application

Sarah is studying for her GCSEs and has a part-time job. By law, she can only work 16 hours a week over the course of a four week period. These are her total hours worked from the last four weeks: 17hrs, 25hrs, 8 hrs and 14hrs. Has she gone over the limit?

Problem Solving

6, 2, 8, 10, 5, _____

Here is a set of five numbers with one missing. What would the last number need to be to give a mean of:

A. 6?

B. 7?

Real-life Application

In industry, designers use the average height of people of different ages to calculate how big to make their clothes.

The transport service has to know the average size of the populations bottoms to know how big to make bus seats!

Your teacher may use your average homework mark to decide on your grade at the end of the term.

Mean – Problem Solving

1. The temperature for UK on a holiday website is found by taking the mean average from 8 different parts of the country. What should they put up if the temperature in the 8 locations are: 12°C 18°C 9°C 12°C 15°C 20°C 21°C 13°C
2. 6 friends are going on holiday and it works out to be £120 each. 1 of them is the birthday boy so his friends decide to cover his cost. How much do all 5 friends need to pay each now?
3. 4 people have the following number of counters: 4, 6, 3, 7. If we were to share the counters equally between them, how many would they get each?
4. Tickets to the cinema cost £6 each. 5 Friends go and they have the following amounts of money each; £3 £8 £6 £4 £3 Do they have enough money between them to go to the cinema? (Show your working)
5. The average (arithmetic mean) of a list of 6 numbers is 20. If we remove one of the numbers, the average of the remaining numbers is 15. What is the number that was removed?
6. The mean weight of a group of seven boys is 56 kg. The individual weights (in kg) of six of them are 52, 57, 55, 60, 59 and 55. Find the weight of the seventh boy.
7. A cricketer has a mean score of 58 runs in nine innings. Find out how many runs are to be scored by him in the tenth innings to raise the mean score to 61.
8. The mean of five numbers is 28. If one of the numbers is excluded, the mean gets reduced by 2. Find the excluded number.
9. The mean weight of a class of 35 students is 45 kg. If the weight of the teacher be included, the mean weight increases by 500 g. Find the weight of the teacher.

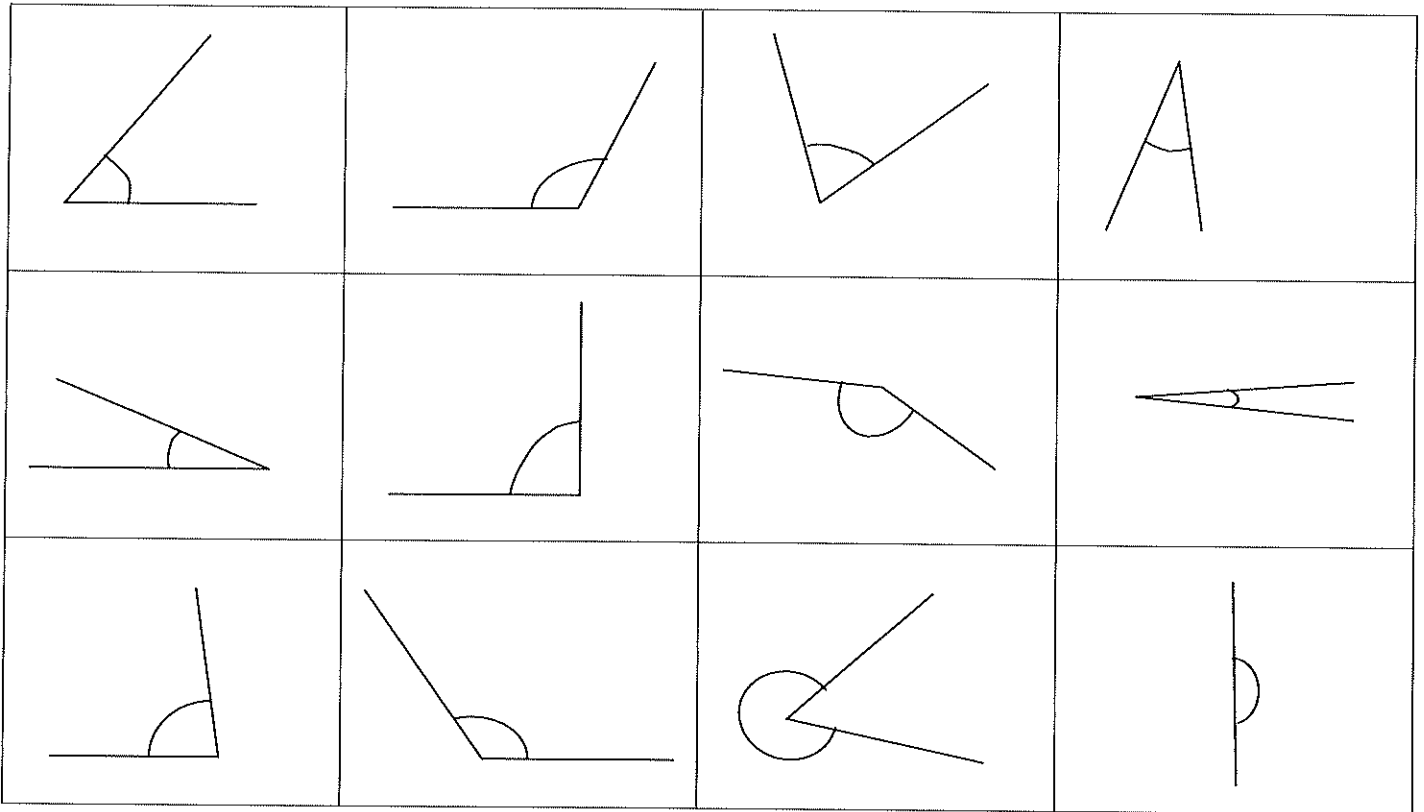
Major Extension

1. Mr. Myones drives 3 hours at an average speed of 40 miles per hour. Then he drives 2 hours at a speed of 35 miles per hour. What is his average speed for the whole trip?
2. Miss Holton drives 4 hours at an average speed of 30 miles per hour. Then she drives 2 hours at a speed of 45 miles per hour. What is her average speed for the whole trip?
3. A family took 2 hours to drive from City A to City B at a speed of 55 miles per hour. On the way home they took 3 hours at a speed of 40 miles per hour. What was their average speed for the whole trip?

L.O – To use a protractor to measure angles

Tip: Make sure you line up the cross of the protractor with the corner of the angle.

Challenge: Write whether each angle is an obtuse, acute or right angle. Then use a protractor to measure each angle.



Now can you use the protractor to draw angles of the following degrees?

1) 45°

2) 120°

3) 20°

Introduce Angles

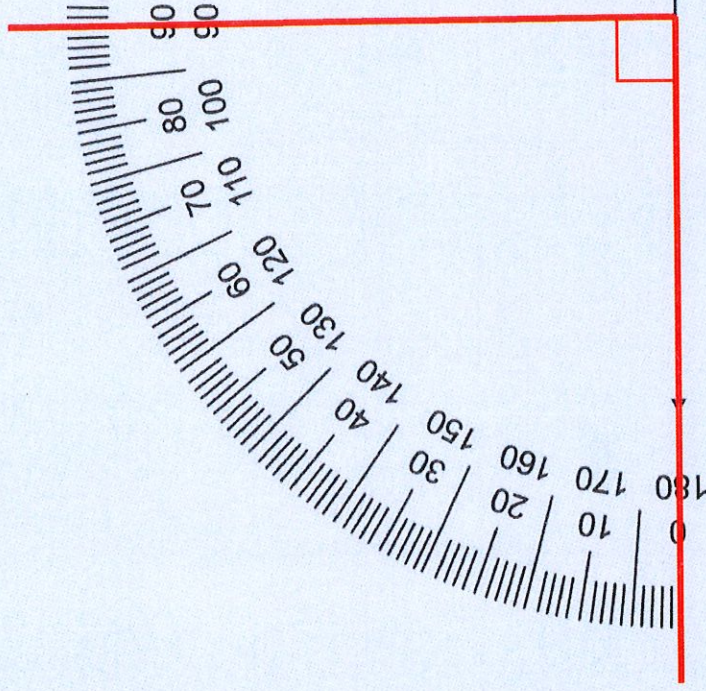
6



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Activity 1

Introduce Angles



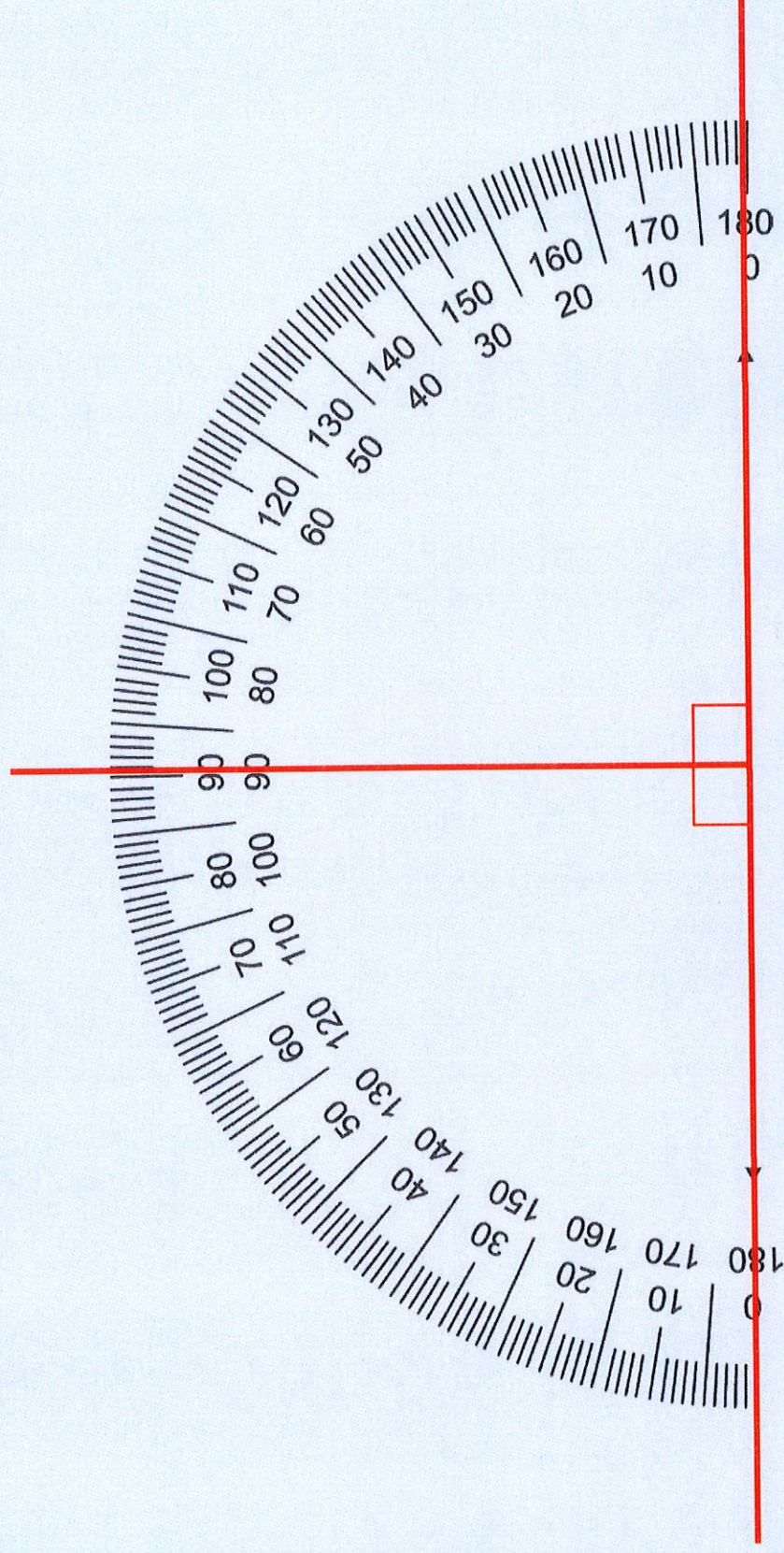
There are ____ degrees in a right angle.

?

If there are 90 degrees in one right angle, how many are there in two?

Activity 1

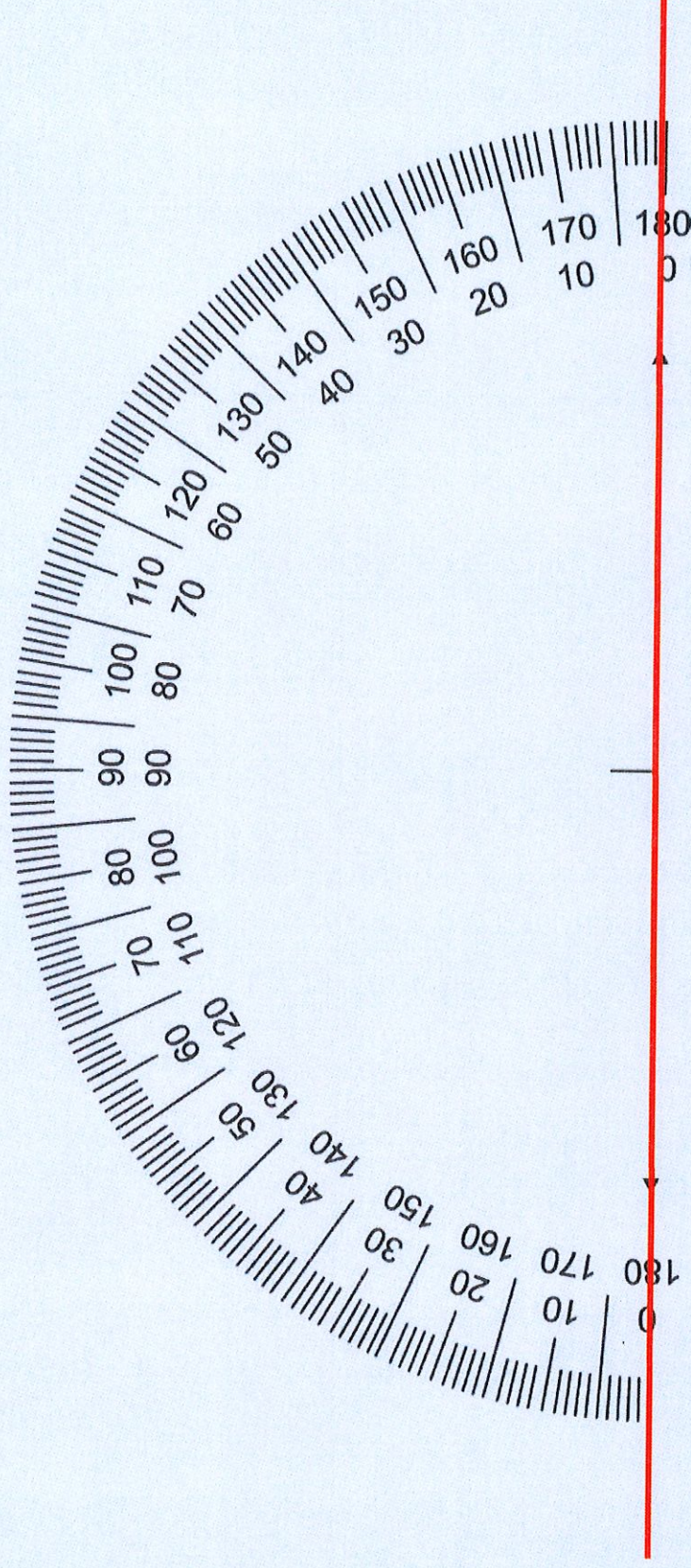
Introduce Angles



There are ____ right angles on a straight line.

Activity 1

Introduce Angles



There are _____ degrees on a straight line.

Activity 2

Introduce Angles

Complete the table.

Angle	Fraction of a full turn	Degrees
Right angle	$1\frac{1}{4}$	90
Straight line		
Three right angles		
Full turn		

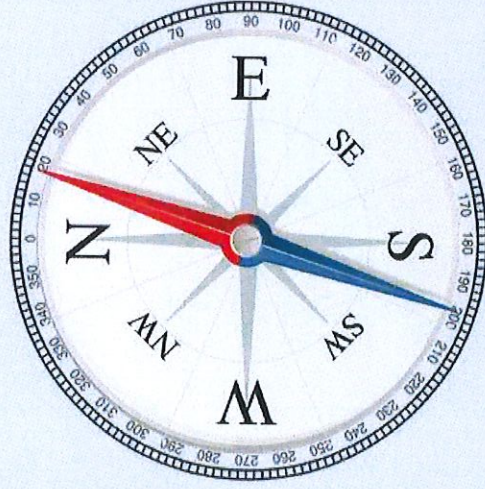
?

How many degrees are there in a quarter/half turn?

Activity 3

Introduce Angles

Use a compass to identify how many degrees there are between:



- north and south (turning clockwise)
- south and east (turning anti-clockwise)
- north-east and south-west (turning clockwise)

?

Between which two compass points can you see a right angle/half turn/three-quarter turn?

Reasoning 1

Introduce Angles

Leanna and Esin are asked how many degrees there are between north-west and south-west.

Who do you agree with? Explain why.

There are 90 degrees between NW and SW.



Leanna

There are 270° between NW and SW.



Esin

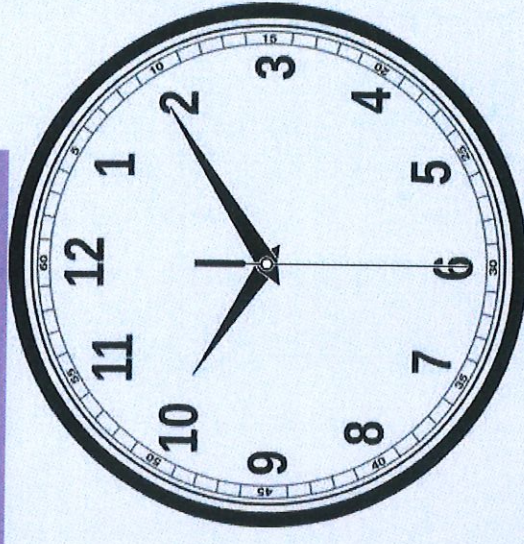
Reasoning 2

Introduce Angles

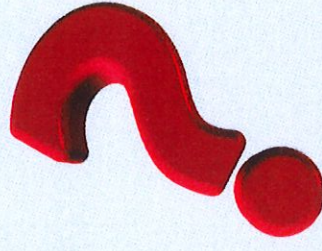
If it takes 60 minutes for the minute hand to travel all the way round the clock, how many degrees does the minute hand travel in:

- 6 minutes
- 10 minutes

How many minutes have passed if the minute hand has moved 120° ?



Always, Sometimes, Never?



W to S = 90 degrees

NE to SW = 180 degrees

E to SE in a clockwise direction $> 90^\circ$

If there are 90 degrees in one right angle, how many are there in two? What about three?

How many degrees are there in a quarter/half turn?

Between which two compass points can you see a right angle/half turn/three-quarter turn?

Calculate Angles

6



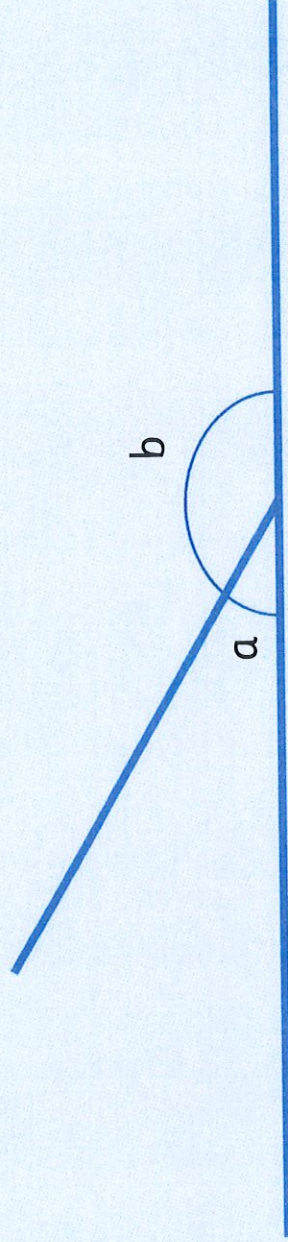
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Activity 1

Calculate Angles

Work out the answers.



$$a + b = \underline{\hspace{2cm}} \quad \quad \quad - a = b$$

$$b + a = \underline{\hspace{2cm}} \quad \quad \quad - b = a$$

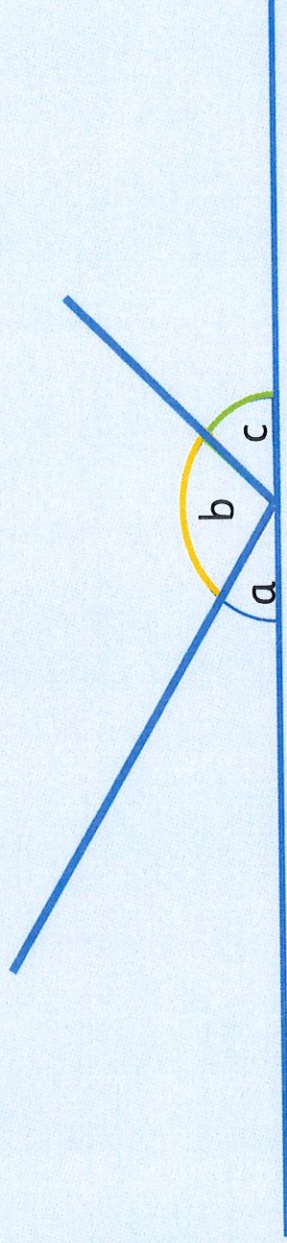


What do we know about a and b ? How do we know this?

Activity 2

Calculate Angles

How many number sentences can you write from the image?



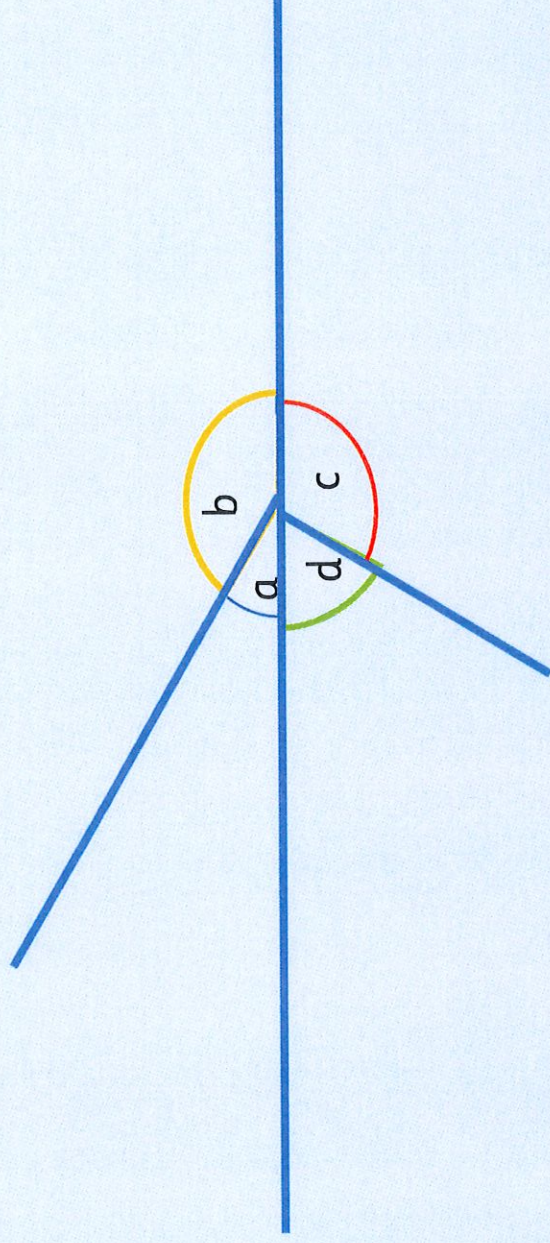
?

Which angle fact might you need to use when answering this question?

Activity 2

Calculate Angles

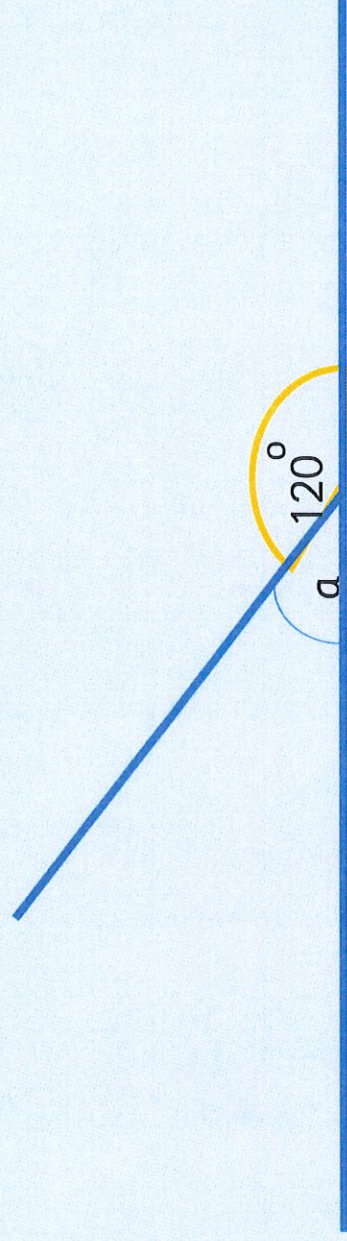
How many number sentences can you write from the image?



Activity 3

Calculate Angles

Calculate the missing angle.



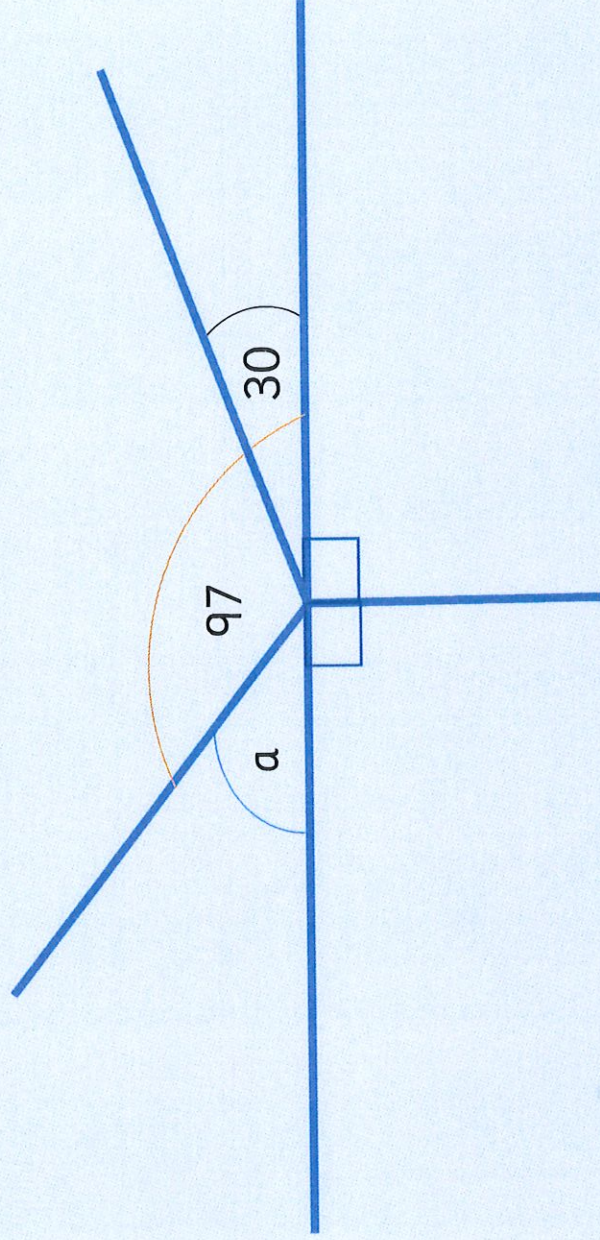
?

Which angles are already given?

Activity 3

Calculate Angles

Calculate the missing angle.

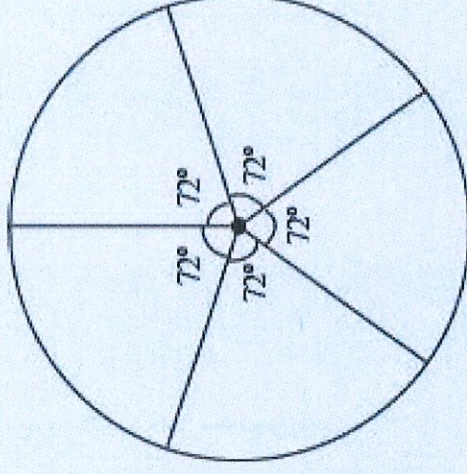


Reasoning 1

Calculate Angles

There are five equal angles around a point.

What is the size of each angle?
Explain how you know.



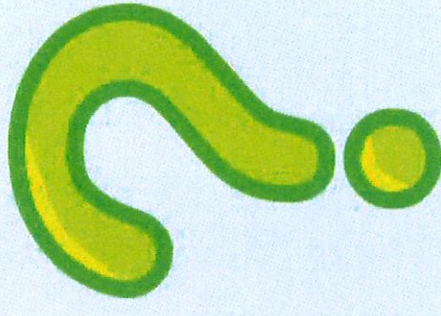
Four angles meet at the same point on a straight line.

One angle is 75° .

The other three angles are equal.

What size are the other three angles?

Draw a diagram to prove your answer.



Reasoning 2

Calculate Angles

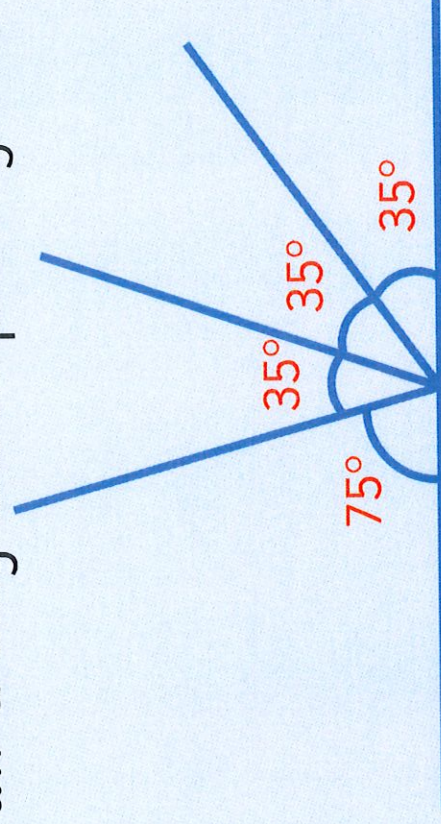
Four angles meet at the same point on a straight line.

One angle is 75° .

The other three angles are equal.

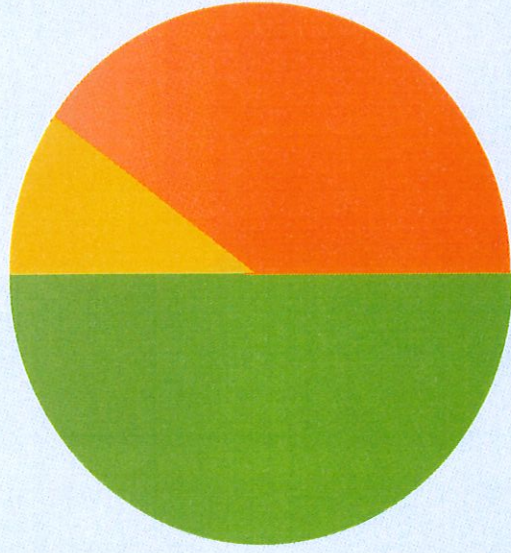
What size are the other three angles?

Draw a diagram to prove your answer.



$$180 - 75 = 105^\circ$$
$$105 \div 3 = 35^\circ$$

Here is a pie chart showing the colour of cars sold by a car dealer.



The number of green cars sold is equal to the total number of orange and yellow cars sold.

The number of orange cars sold is twice the number of yellow cars sold.

Work out the size of the angle for each.



What do we know about a and b ? How do we know this?

Which angle fact might you need to use when answering this question?

Which angles are already given? How can we use this to calculate unknown angles?

Vertically Opposite Angles



6

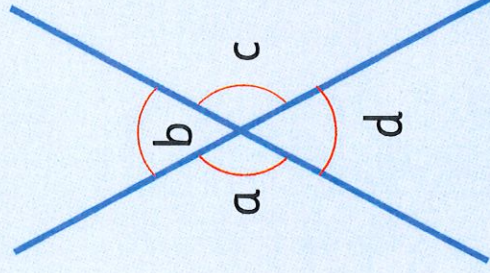
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Activity 1

Vertically Opposite Angles

Take a piece of paper and draw a large 'X'. Mark the angles on as shown. Measure the angles you have drawn.

What do you notice about angles b and d ? What do you notice about angles a and c ? Is this always the case? Investigate with other examples.

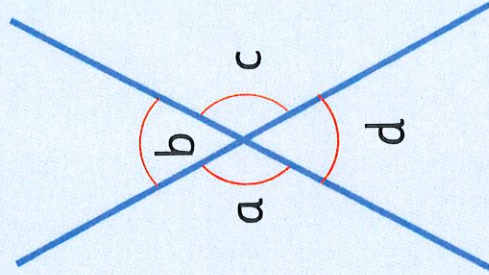


What sentences can we write about vertically opposite angles in relation to other angles?

Activity 2

Vertically Opposite Angles

Use the letters from the diagram to fill in the blanks.



$$\underline{\quad} = \underline{\quad}$$

$$\underline{\quad} + \underline{\quad} = 180 \qquad \underline{\quad} + \underline{\quad} = 180$$

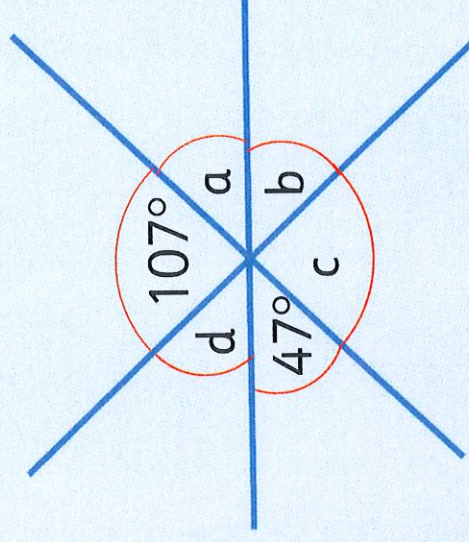
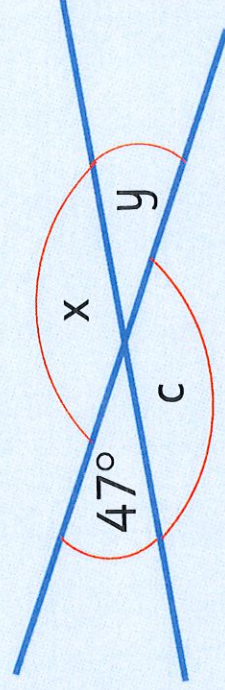
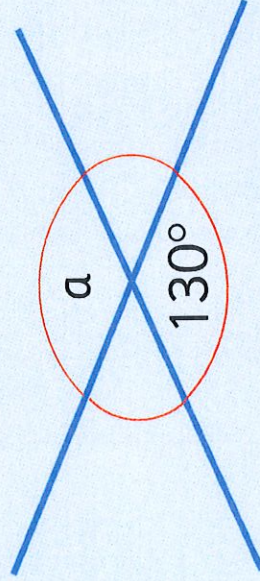
?

How can we find the missing angle?

Activity 3

Vertically Opposite Angles

Find the size of the missing angles.



?

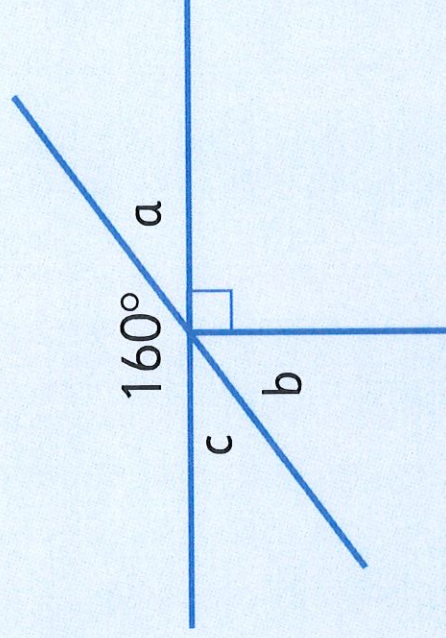
Is there more than one way to find this angle?

Reasoning 1

Vertically Opposite Angles

The diagram below is drawn using three straight lines.

Tia says that it's not possible to calculate all of the missing angles. Do you agree? Explain why.



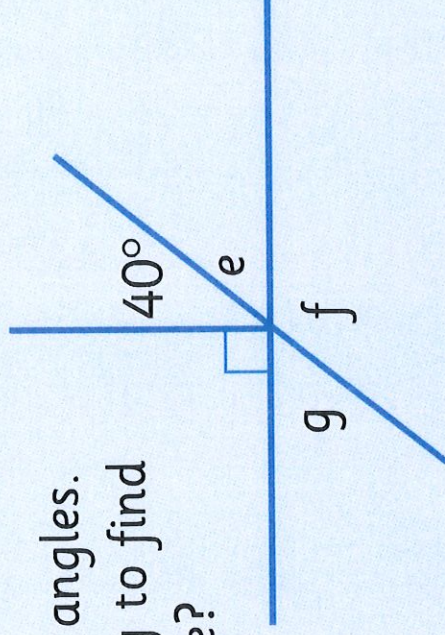
Reasoning 2

Vertically Opposite Angles

The diagram below is drawn using three straight lines.

Malachi says that angle g is equal to 40° because vertically opposite angles are equal. Do you agree? Explain your answer.

Find the size of all missing angles.
Is there more than one way to find the size of each angle?



What sentences can we write about vertically opposite angles in relation to other angles?

How can we find the missing angle?

Is there more than one way to find this angle?

Angles in a Triangle (1)



6

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Activity 1

Angles in a Triangle (1)

Use different-coloured pieces of card to make an equilateral, isosceles, scalene and right-angled triangle.

Use a protractor to measure each interior angle, then add them up.

What do you notice?

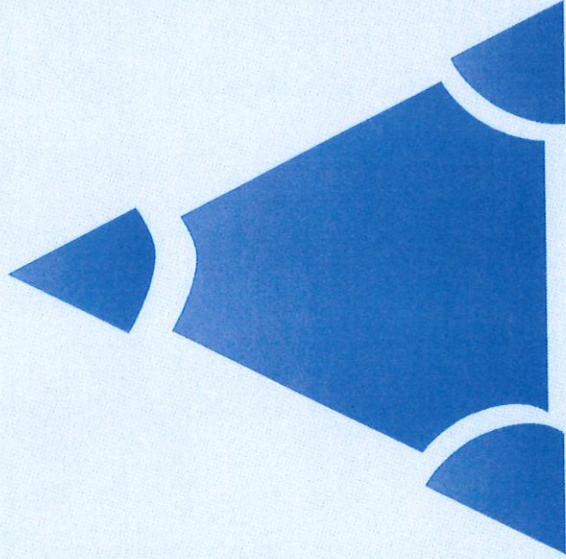


What's the same and what's different about the four types of triangle?

Activity 1

Angles in a Triangle (1)

Now take any of the triangles and tear off the corners. Arrange the corners to make a straight line.



The interior angles of a triangle
add up to ____.

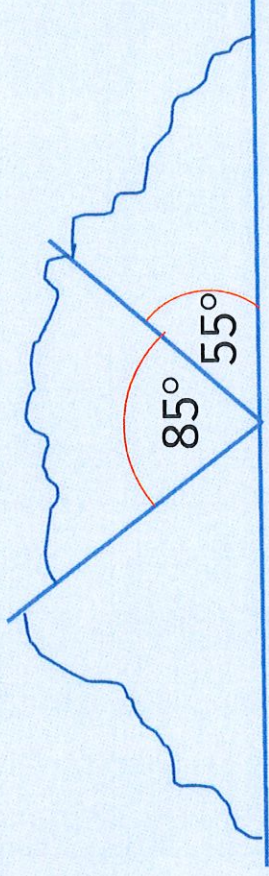
?

What do the three interior angles add up to?

Activity 2

Angles in a Triangle (1)

Calculate the missing angle and state the type of triangle that these corners have been torn from.

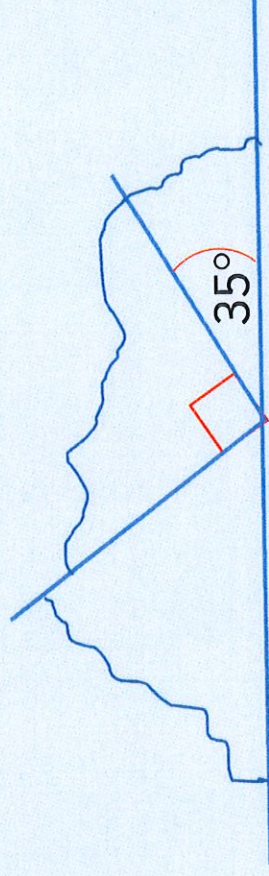


Does the type of triangle change anything?

Activity 2

Angles in a Triangle (1)

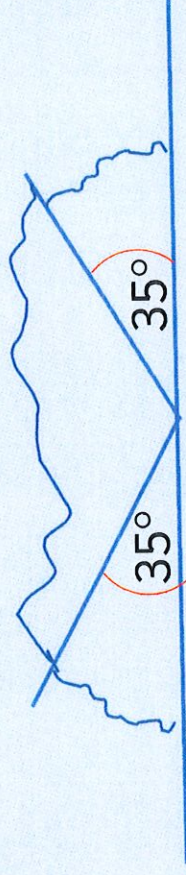
Calculate the missing angle and state the type of triangle that these corners have been torn from.



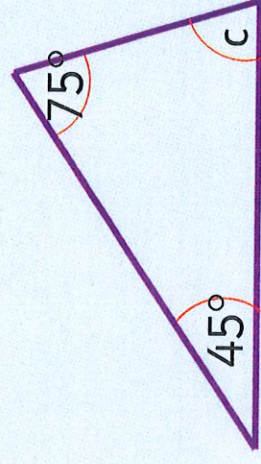
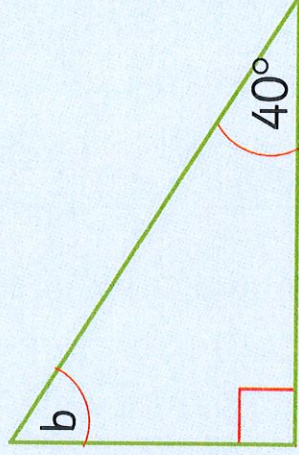
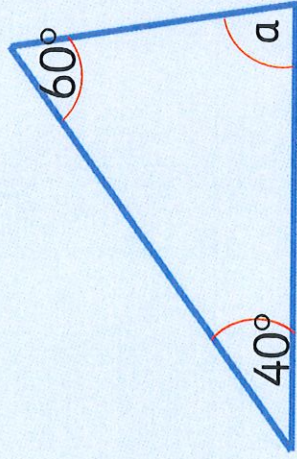
Activity 2

Angles in a Triangle (1)

Calculate the missing angle and state the type of triangle that these corners have been torn from.



Calculate the missing angles.



Does the size of the triangle matter?

Reasoning 1

Angles in a Triangle (1)

Can Malachi be correct? Can you demonstrate this?



Malachi

My triangle has two 90° angles.

Reasoning 2

Angles in a Triangle (1)

Work out the size of each of the angles in the triangle.

My triangle is a scalene triangle. One angle is obtuse. One of the angles measures 56° . The obtuse angle is three times the smallest angle.



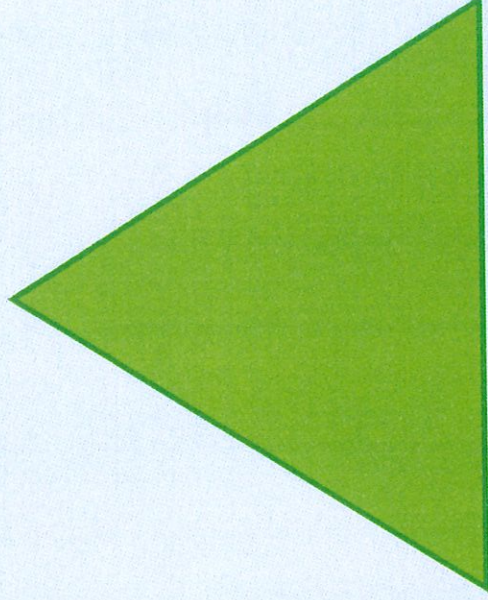
Esin

Reasoning 3

Angles in a Triangle (1)

True or False?

A triangle can never have three acute angles.



What's the same and what's different about the four types of triangle?

What do the three interior angles add up to? Would this work for all triangles?

Does the type of triangle change anything?

Does the size of the triangle matter?

Angles in a Triangle (2)



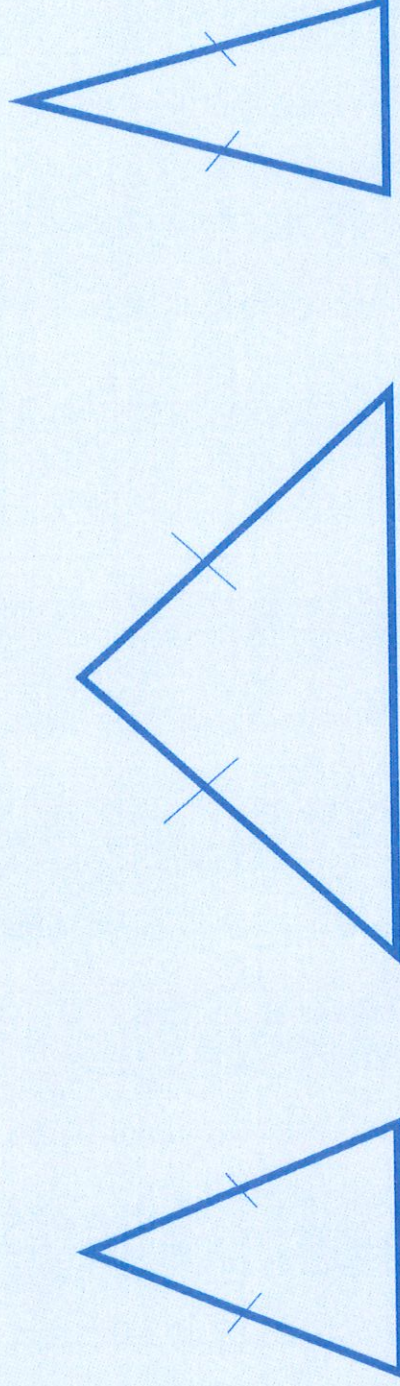
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Activity 1

Angles in a Triangle (2)

Identify which angles will be identical in the isosceles triangles.



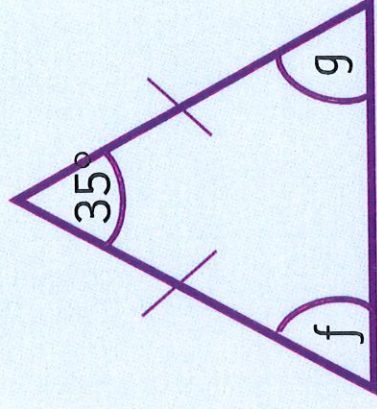
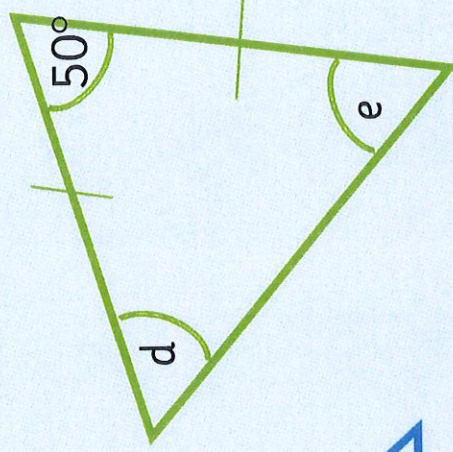
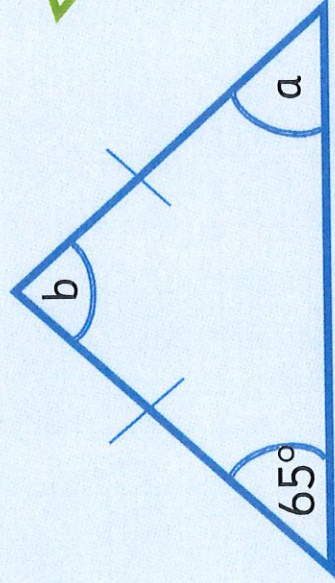
?

How can we identify sides which are the same length on a triangle?

Activity 2

Angles in a Triangle (2)

Calculate the missing angles in the isosceles triangles.



?

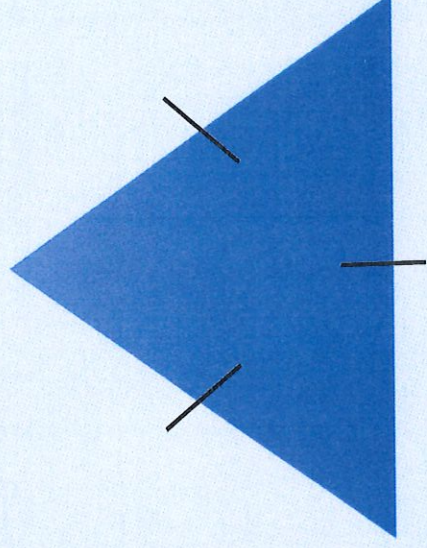
How can we use the hatch marks to identify the equal angles?

Activity 2

Angles in a Triangle (2)

What type of triangle is this? What will the size of each angle be? How do you know? Will this always be the same for this type of triangle?

Explain your answer.



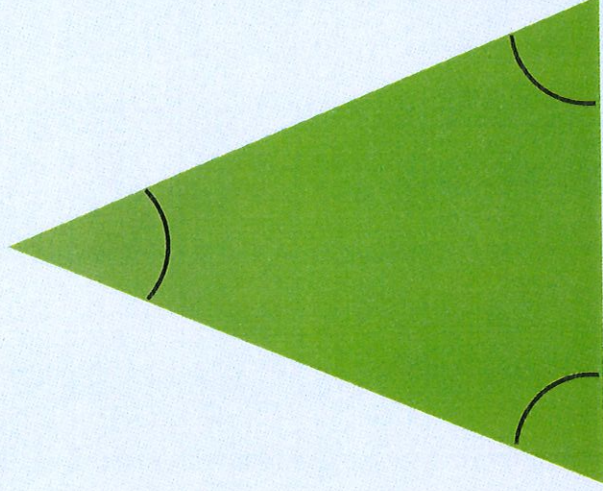
?

If you know one angle in an isosceles triangle, what else do you know?

Reasoning 1

Angles in a Triangle (2)

I have an isosceles triangle. One angle measures 44 degrees. What could the other angles measure?



Reasoning 2

Angles in a Triangle (2)

What type of triangle is each person describing?
Explain how you know.

My angles are
 70° , 70° and
 40° .



Esin

My angles are
 45° , 45° and
 90° .



Malachi

My angles are
 60° , 60° and
 60° .



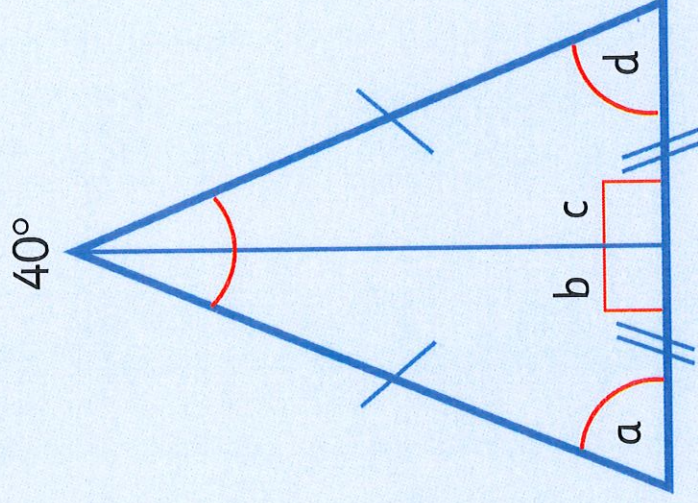
Tia

Reasoning 3

Angles in a Triangle (2)

How many sentences can you write to express the relationships between the angles in the triangles?

One has been done for you.



$$40^\circ + a + d = 180^\circ$$

How can we identify sides which are the same length on a triangle?

How can we use the hatch marks to identify the equal angles?

If you know one angle in an isosceles triangle, what else do you know?

Can you have an isosceles right-angled triangle?

Angles in a Triangle (3)



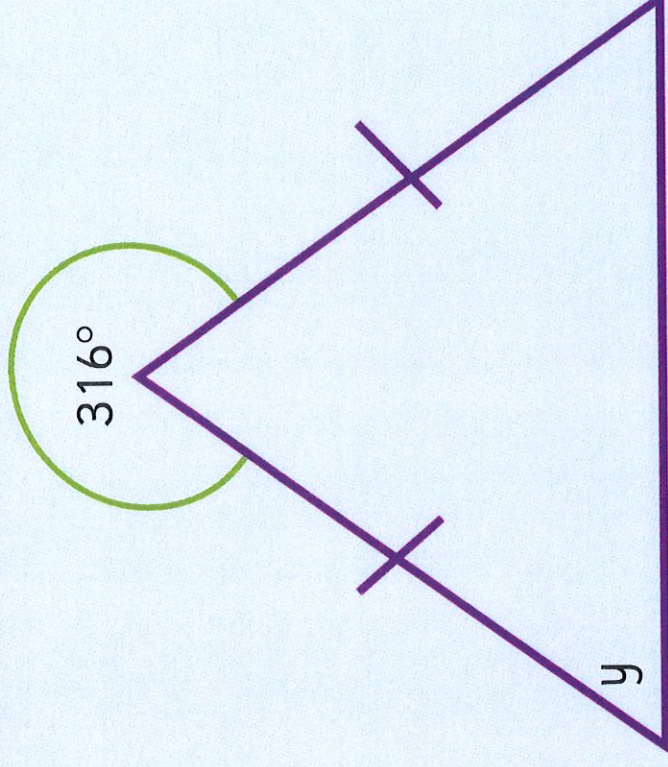
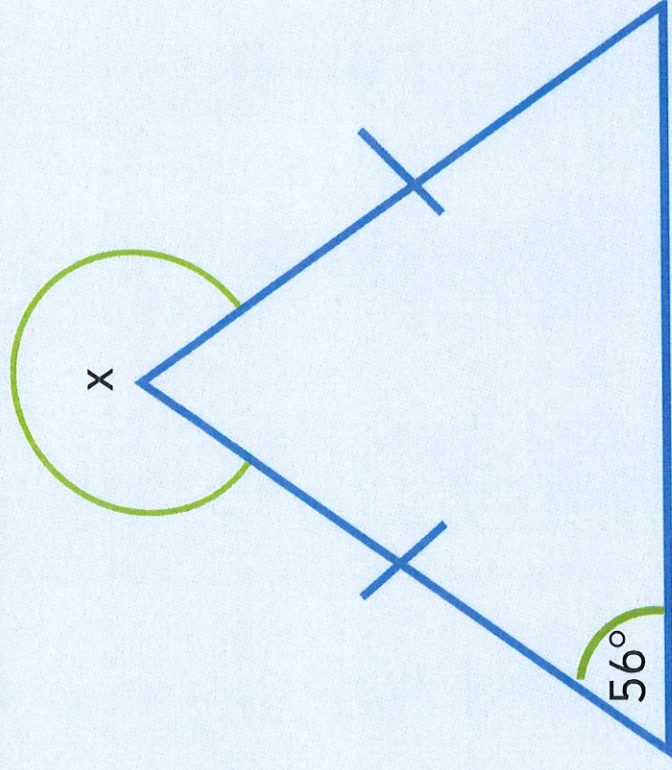
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Activity 1

Angles in a Triangle (3)

Work out the value of x and y . Explain each step of your working.



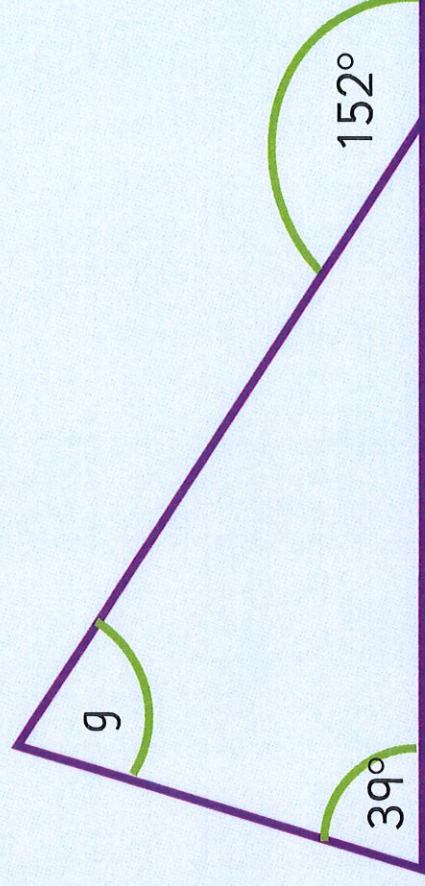
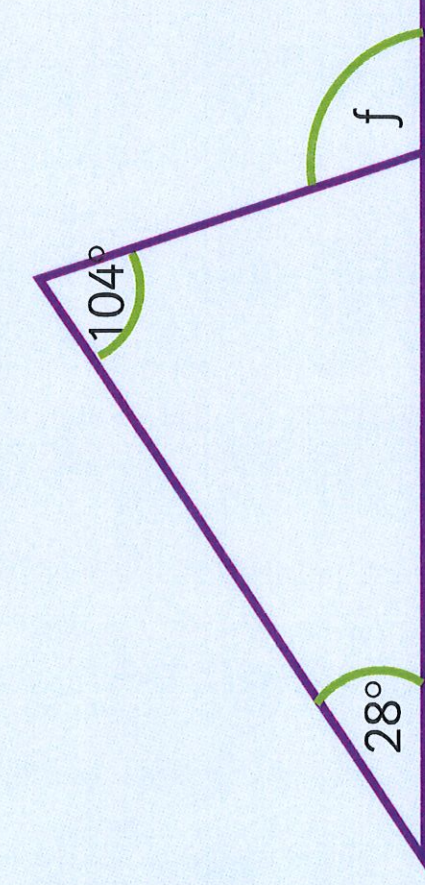
?

Is it sensible to estimate the angles before calculating them?

Activity 2

Angles in a Triangle (3)

Work out the value of f and g .
Explain each step of your working out.

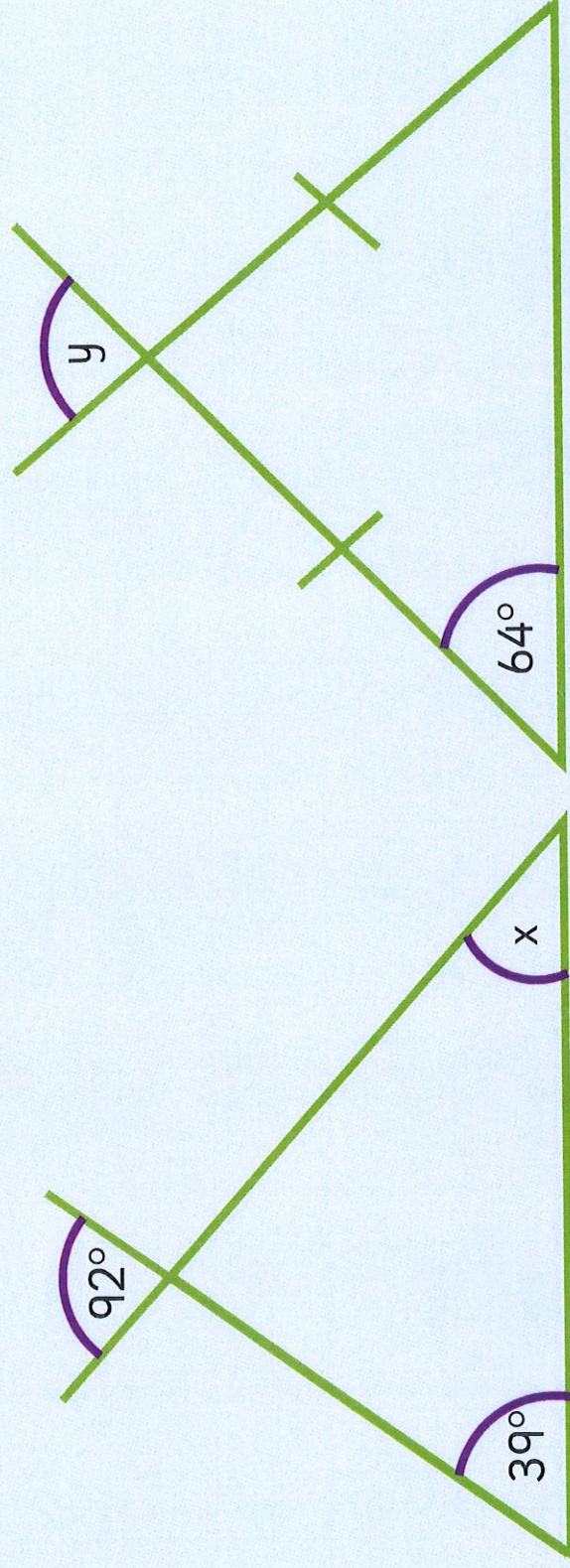


Can you identify the type of triangle? How will this help you?

Activity 3

Angles in a Triangle (3)

Work out the value of x and y .
Explain each step of your working out.



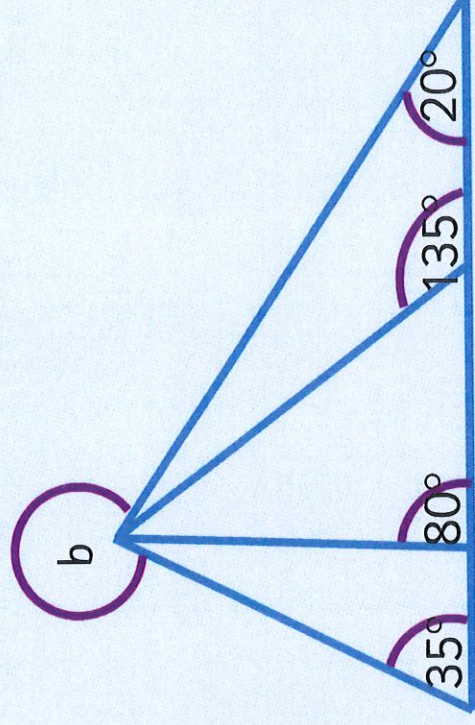
?

Which angle can you work out first? Why?

Reasoning 1

Angles in a Triangle (3)

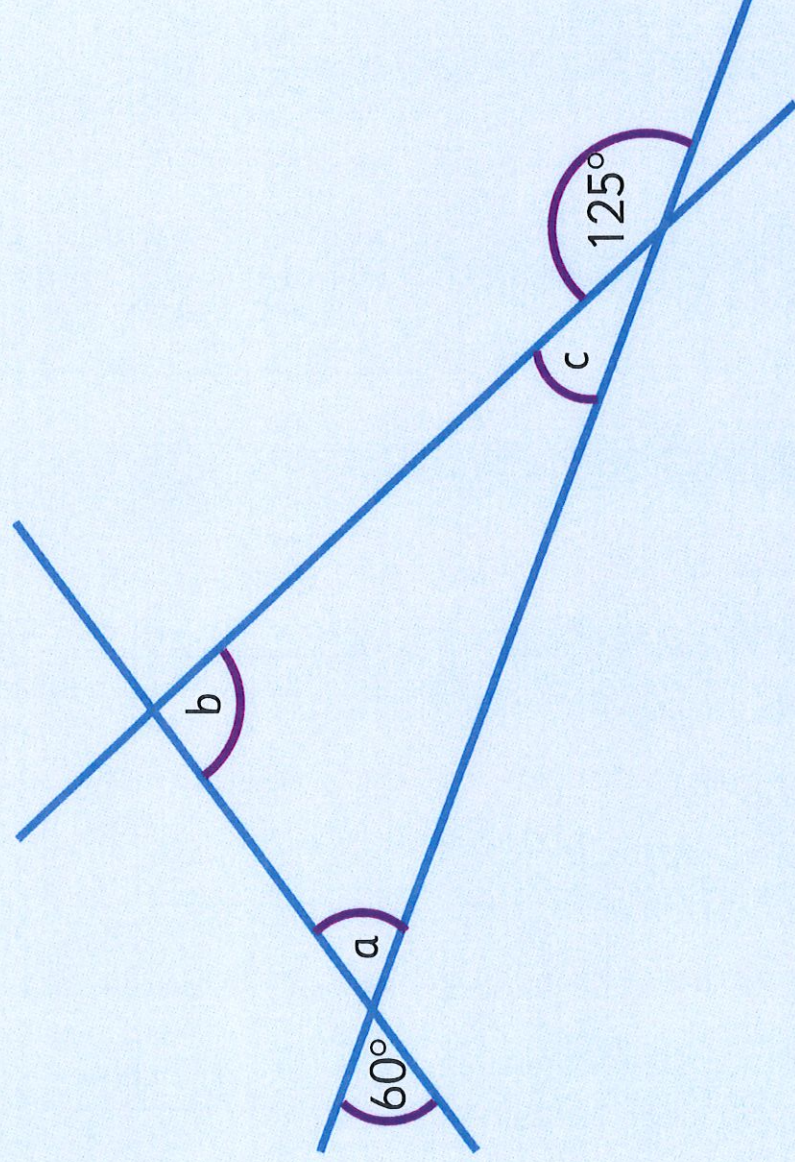
Calculate the size of the reflex angle b .



Reasoning 2

Angles in a Triangle (3)

Calculate the size of angles a , b and c .
Give reasons for all your answers.



Is it sensible to estimate the angles before calculating them?

Are the triangles drawn accurately?

Can you identify the type of triangle?

How will this help you calculate the missing angle?

Which angle can you work out first? Why?

What else can you work out?

Angles in Quadrilaterals



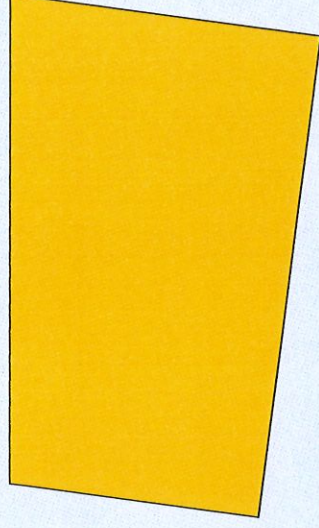
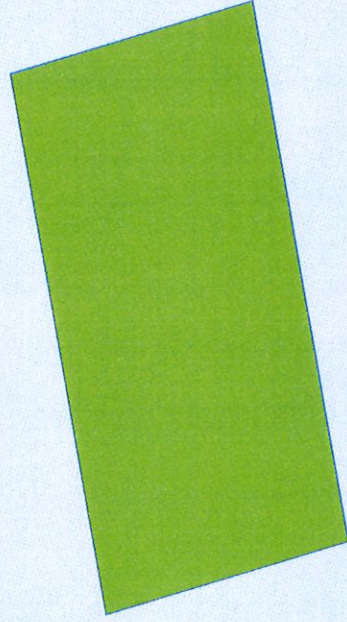
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Activity 1

Angles in Quadrilaterals

Take two quadrilaterals. For the first quadrilateral, measure the interior angles using a protractor.



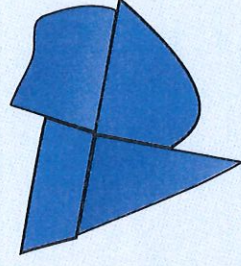
?

Is a rectangle a parallelogram? Is a parallelogram a rectangle?

Activity 1

Angles in Quadrilaterals

For the second, tear the corners off and place the interior angles at a point as shown.



What's the same?

What's different?

Is this the case for other quadrilaterals?

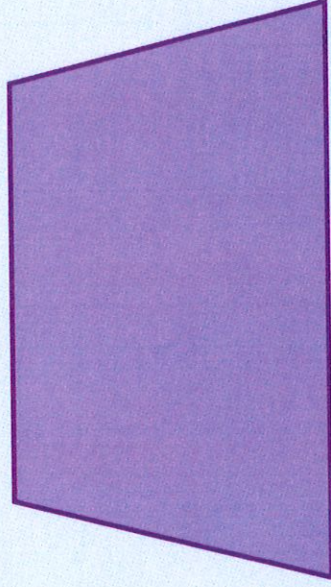
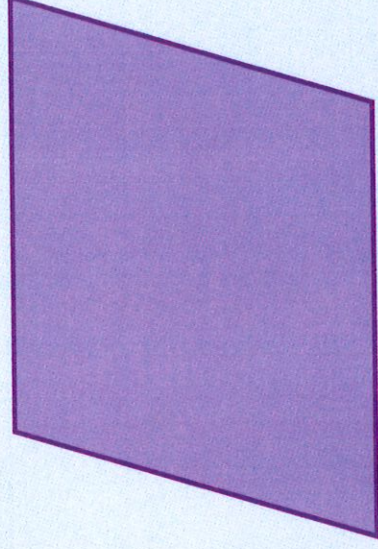
Activity 2

Angles in Quadrilaterals

Here are two trapeziums. What's the same? What's different?

Can you draw a different trapezium?

Measure the interior angles of each one and find the total.



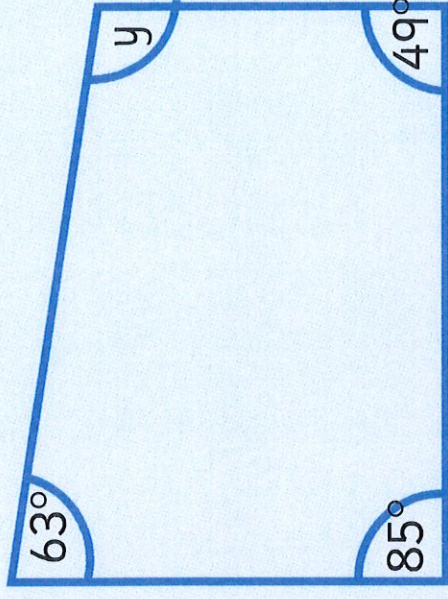
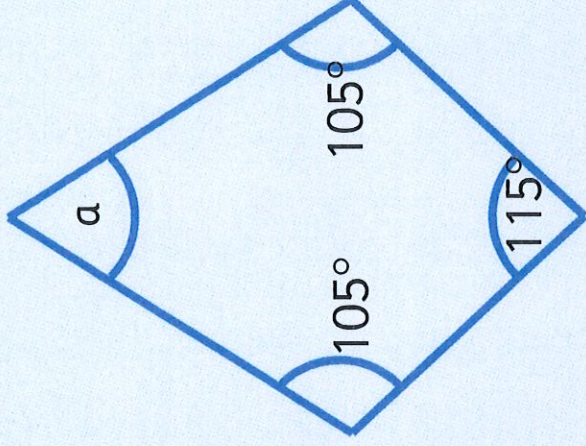
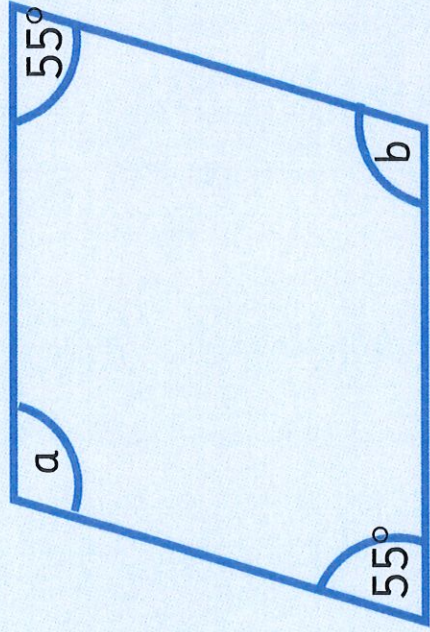
?

What is the difference between a trapezium and an isosceles trapezium?

Activity 3

Angles in Quadrilaterals

Calculate the missing angles.



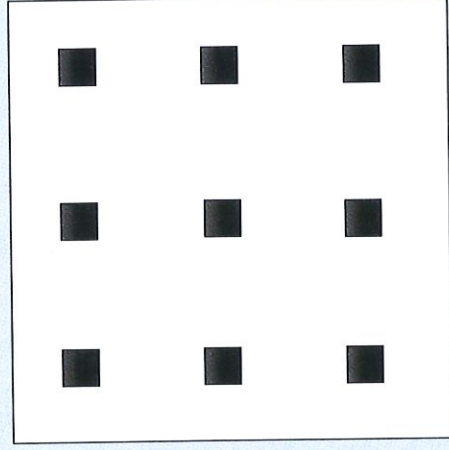
?

If you know three of the interior angles, how could you work out the fourth angle?

Reasoning 1

Angles in Quadrilaterals

How many quadrilaterals can you make on the geoboard?



Identify the names of the different quadrilaterals. What do you notice about the angles in certain quadrilaterals? If your geoboard was 4×4 , would you be able to make any different quadrilaterals?

Reasoning 2

Angles in Quadrilaterals

Draw two different shapes to prove Zach wrong.
Measure and mark on the angles.

All quadrilaterals
have at least one
right angle.



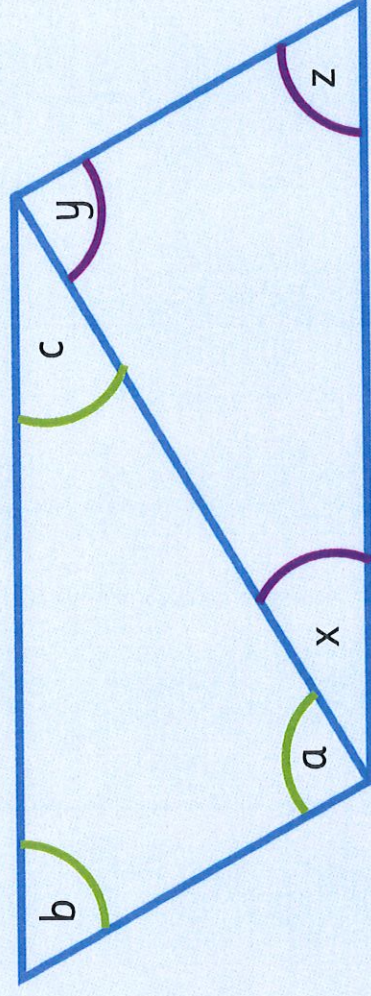
Zach

Reasoning 3

Angles in Quadrilaterals

This quadrilateral is split into two triangles. Use your knowledge of angles in a triangle to find the sum of angles in a quadrilateral.

Split other quadrilaterals into triangles too. What do you notice?



Is a rectangle a parallelogram? Is a parallelogram a rectangle?

What do you notice about the opposite angles in a parallelogram?

Is a square a rhombus? Is a rhombus a square?

What do you notice about the opposite angles in a rhombus?

What is the difference between a trapezium and an isosceles trapezium?

If you know three of the interior angles, how could you work out the fourth angle?

Angles in Polygons

6



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Activity 1

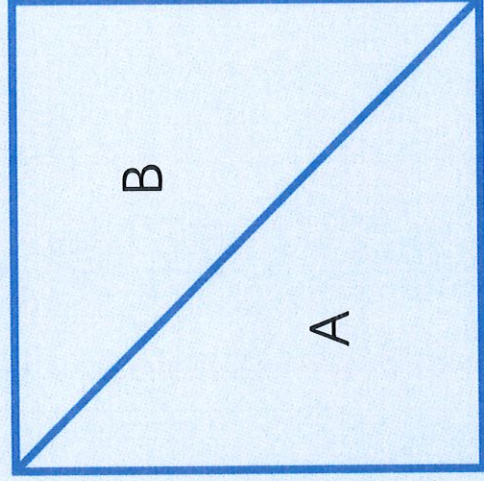
Angles in Polygons

Draw any quadrilateral and partition it into two triangles.

What do the interior angles of triangle A add up to?

What do the interior angles of triangle B add up to?

What is the sum of angles in a quadrilateral?



?

What is the sum of the interior angles of a triangle?

Activity 2

Angles in Polygons

Use the same method to complete the table. What do you notice? Can you predict the angle sum of any other polygons?

Shape	No. of sides	No. of triangles	$180 \times \text{no. of angles}$	Sum of internal angles
Quadrilateral	4	2	180×2	360
Pentagon	5	3		
Hexagon				
Heptagon				

Reasoning 1

Angles in Polygons

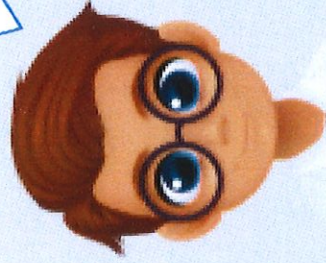
Use the clues to work out what shape each person has.
What is the sum of the interior angles of each shape?

My polygon is
made up of five
triangles.



Leanna

The sum of my
angles is more
than 540° but
less than 900° .



Zach

The sum of my
angles is
equivalent to the
sum of angles in
three triangles.

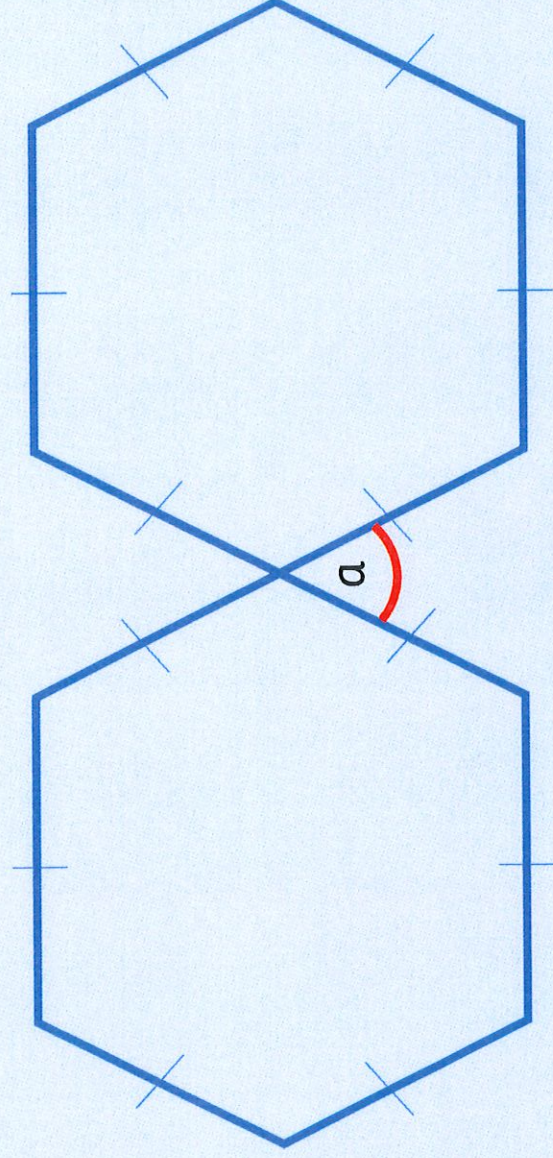


Esin

Reasoning 2

Angles in Polygons

Here are two regular hexagons.
The interior angles of a hexagon add up to 720° .
Use this fact to work out angle a in the diagram.



What is a regular polygon? What is an irregular polygon?

What is the sum of the interior angles of a triangle?

How can we use this to work out the interior angles of polygons?

Can we spot a pattern in the table? What predictions can we make?