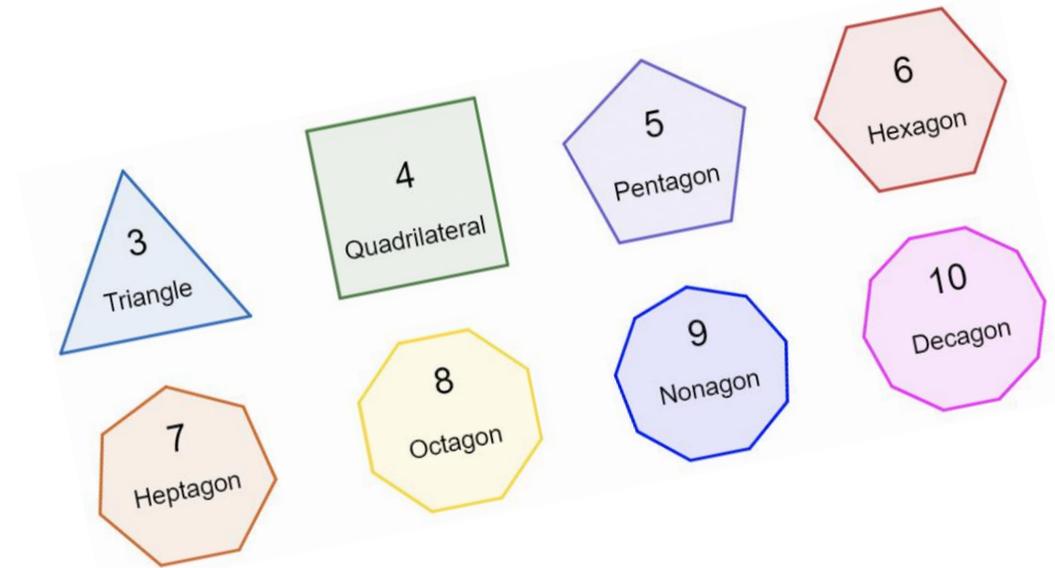


Home Learning MATHS

Week 4

Properties of shapes



Here are 5 lessons that will help with your understanding of shape. Each day's lesson is clearly labelled with a section of the PowerPoint and the tasks will be labelled along the way. Please complete the tasks in your workbook unless it is stated (write the date a learning objective at the start of a new days learning).

*remember that you can email me if you have a question



Lesson 1 - Monday

LO: To introduce angles and how to use a protractor

What is an angle?



What is a protractor?

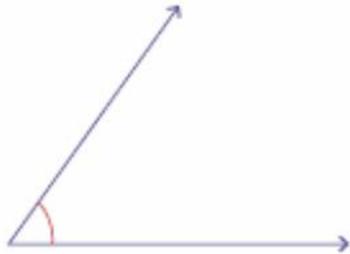
Can you name the 4 different types of angles?

Task 1:

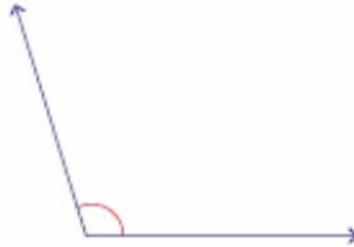
In your workbook, have a go at answering these three questions



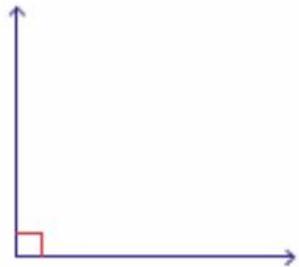
The 4 different types of angles



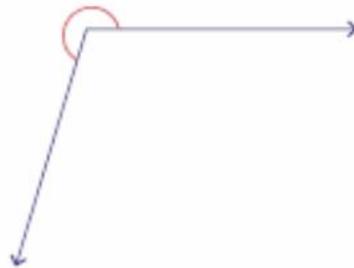
Acute angle
Less than 90°



Obtuse angle
More than 90° but
less than 180°

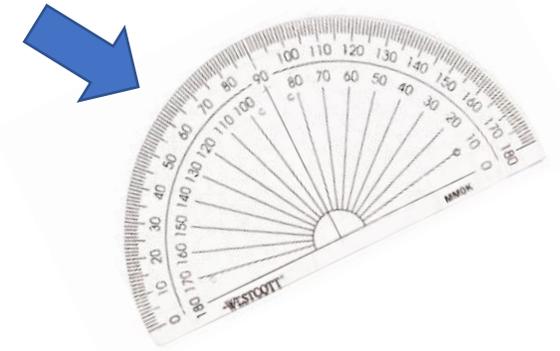


Right angle
Exactly 90°



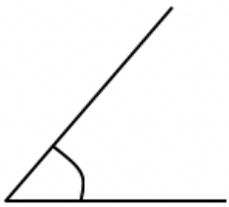
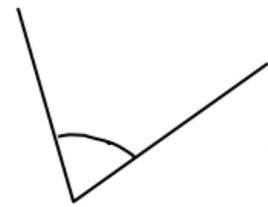
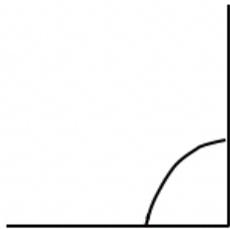
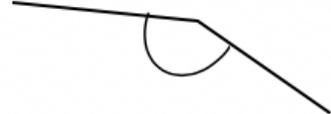
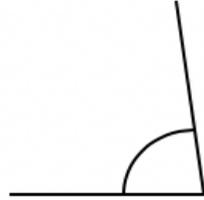
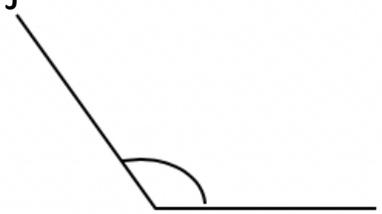
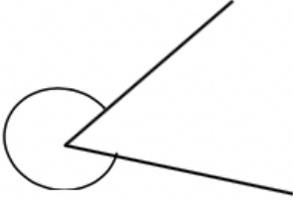
Reflex angle
More than 180° but
less than 360°

An angle is the measurement of the amount of a turn. They are measured in degrees using a protractor.



Task 2:

Draw 4 shapes that have at least 1 of the types of angles. I want to see all 4 angle types and identify the angle with a label.

A 	B 	C 	D 
E 	F 	G 	H 
I 	J 	K 	L 

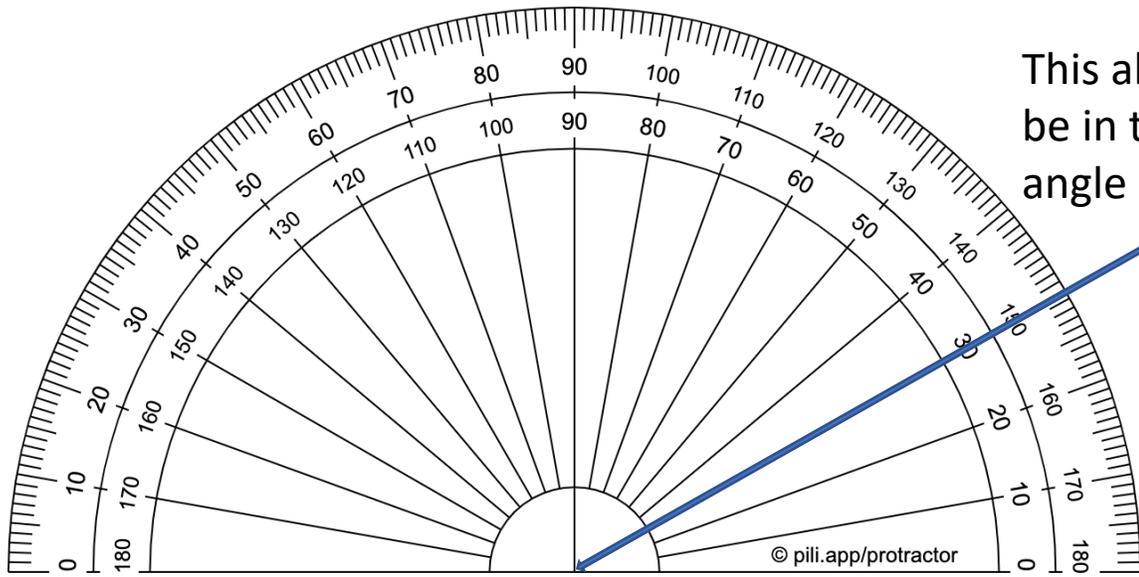


Look at L. Which group does that belong to? Or maybe it doesn't. What do you think?

Task 3:

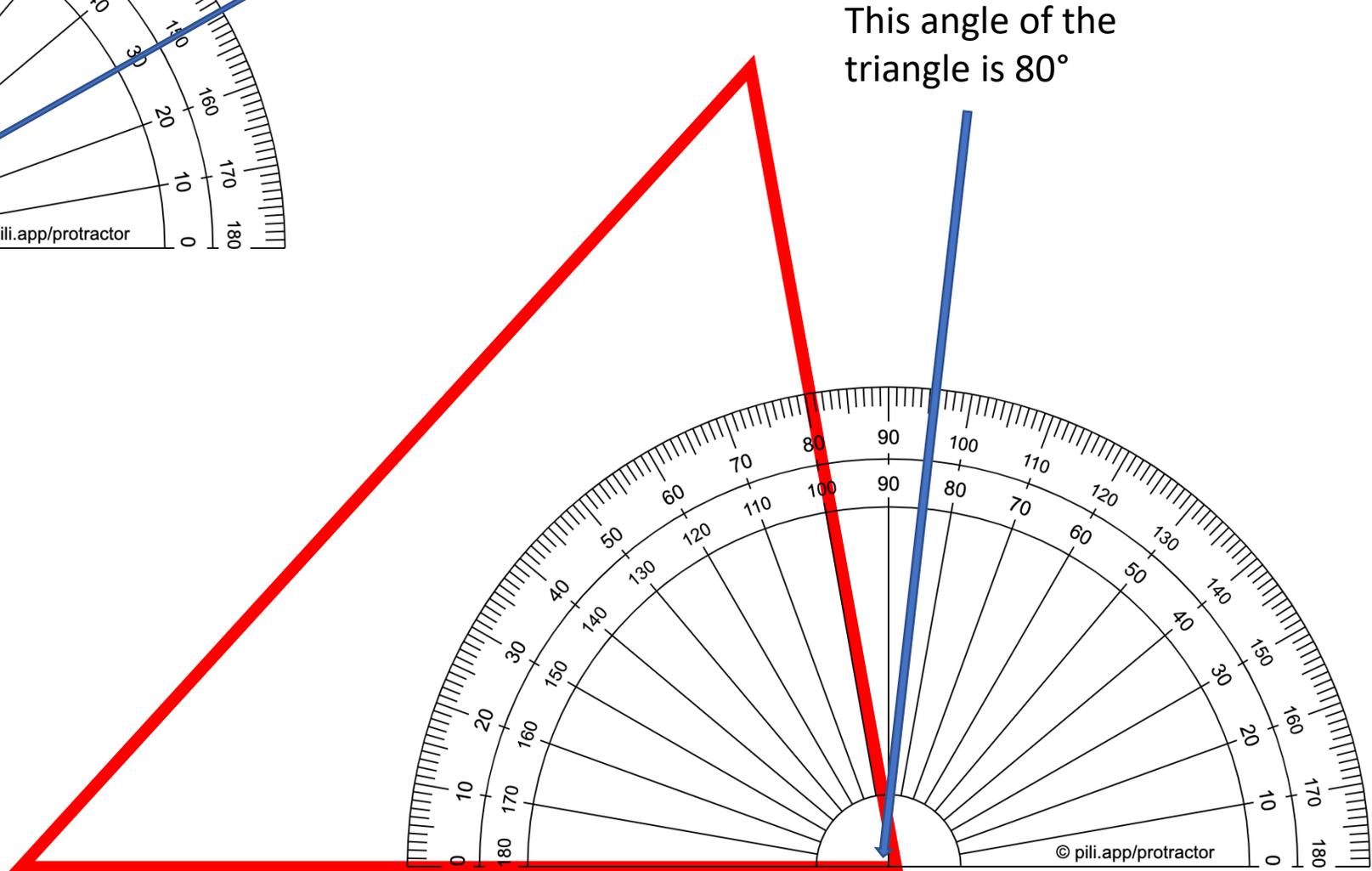
Sort the angles above into their appropriate type.



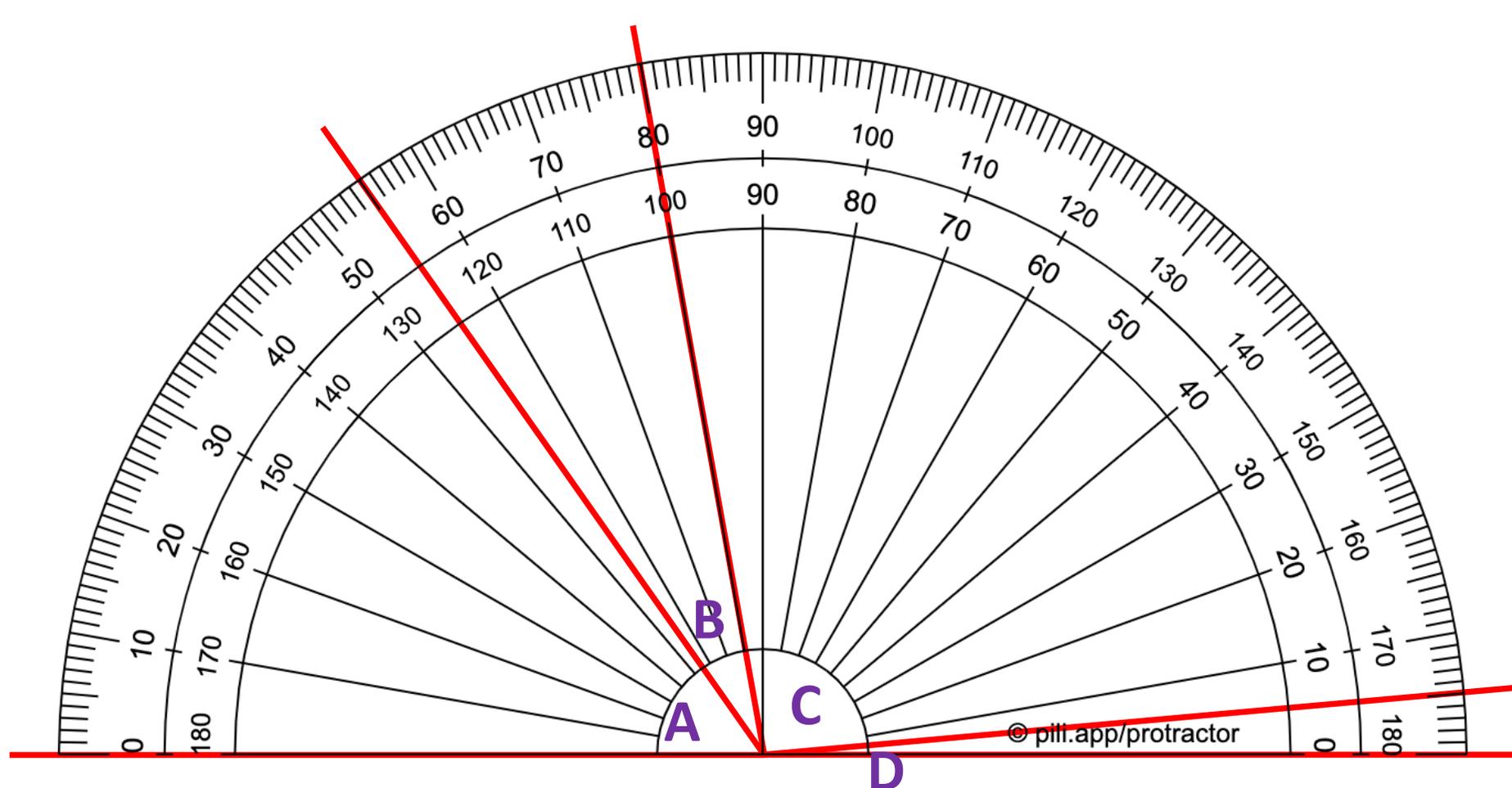


This always needs to be in the corner of the angle

The 0 always needs to be lined up on one of the lines



This angle of the triangle is 80°



Task 4:

Use the protractor to calculate angles A, B, C, and D.

After that, label the type the angle they are.



Task 5:

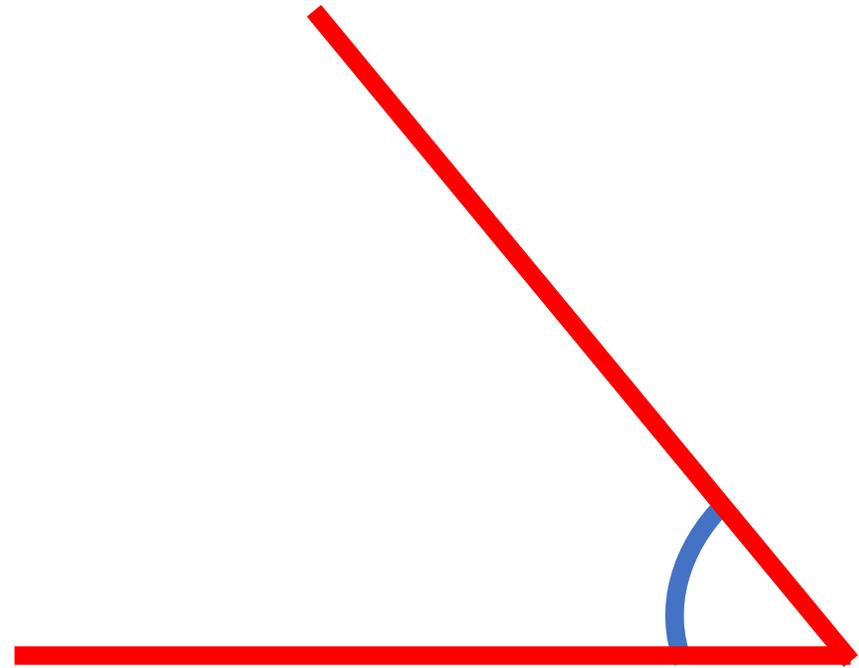
Mrs Cresswell wants to know how you would measure an angle that is more than 180° . Try to help her out by giving her some advice.

Task 6:

Mr Cheeseman measures this angle.

He says that it is 130°

Explain why he is wrong.





Lesson 2 - Tuesday

LO: Angles and how to use a protractor - Continued

There are 90 degrees in one right angle so how many would there be in 2, 3 and 4 right angles?

If you know that 4 right angles (quarter turns) make a whole turn, how many degrees are there in a half turn?

Copy and complete the table

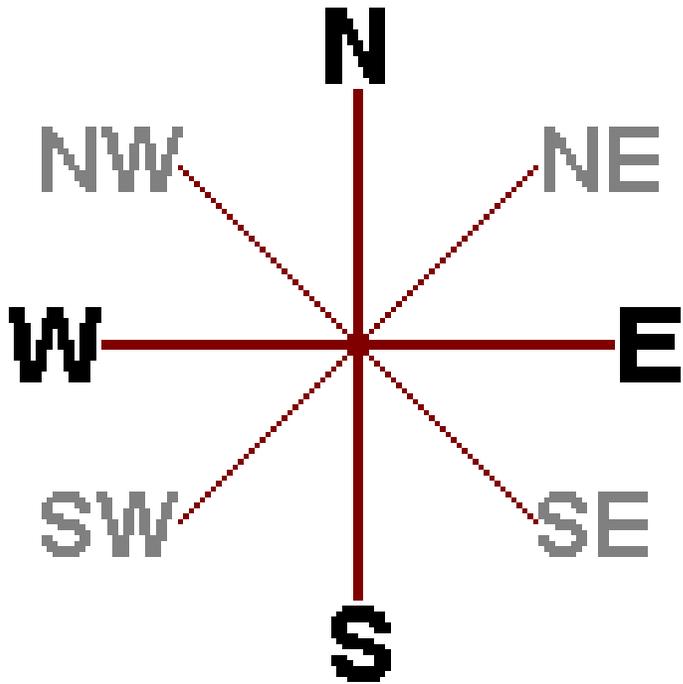
Angle	Fraction of a full turn	Degrees
Right angle	$\frac{1}{4}$	90°
Straight line		
Three right angles		
Full turn		

Task 1:

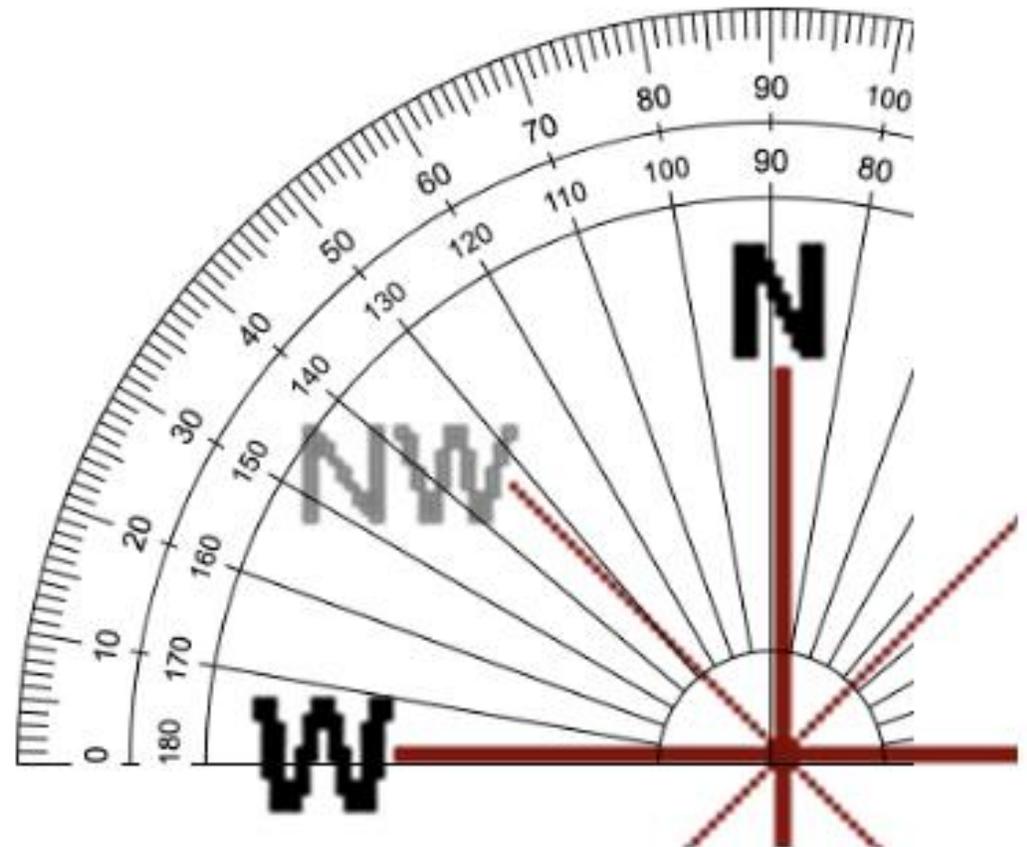
Answer the questions in your workbook

A compass is used to guide direction.

If I was facing North and completed 1 full turn, I would still be facing North.



There are 4 main points on a compass North, East, South and West and together they make a complete. We know that a complete turn is 360° so therefore one quarter turn would be 90° . The image shows that the angle between West and North is 90° .



Task 2: Using your compass and angle knowledge, answer the following questions.

1. How many degrees between North and South turning clockwise?
2. How many degrees between South and East turning clockwise?
3. How many degrees between North and West turning anti-clockwise?
4. How many degrees between East and North turning clockwise?
5. Mr Cheeseman and Mrs Cresswell are asked how many degrees there are between North-West and South-West.



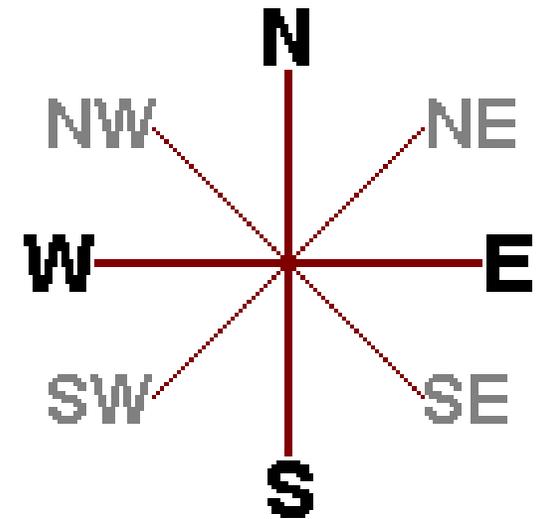
There are 90 degrees between NW and SW.



There are 270° between NW and SW

These were their responses.

Who do you agree with?
Explain why.



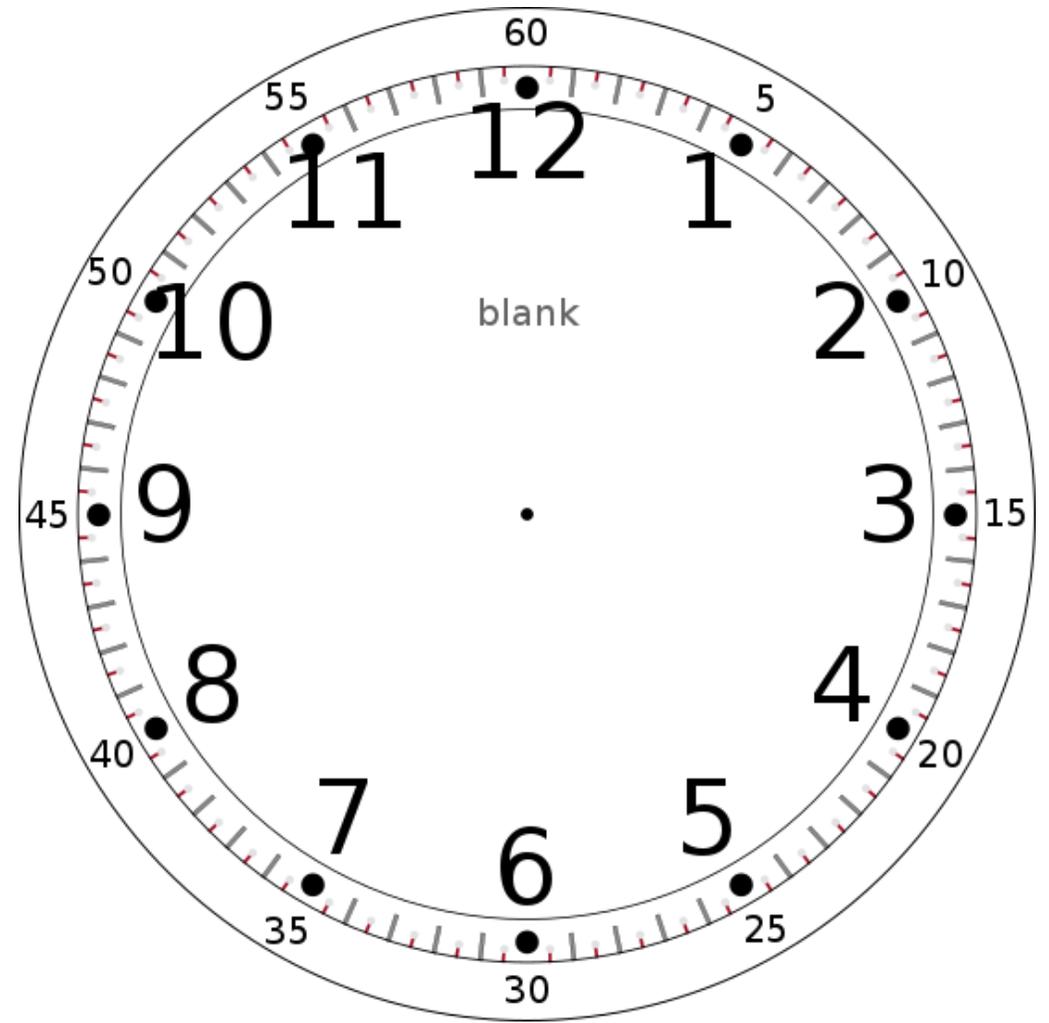
Investigation

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

7 minutes

12 minutes

How many minutes have passed if the minute hand has moved **162°**?





Lesson 3 - Wednesday

Lo: Calculating angles

Before we begin calculating angles there are some important facts that you need to know in order to make things easier

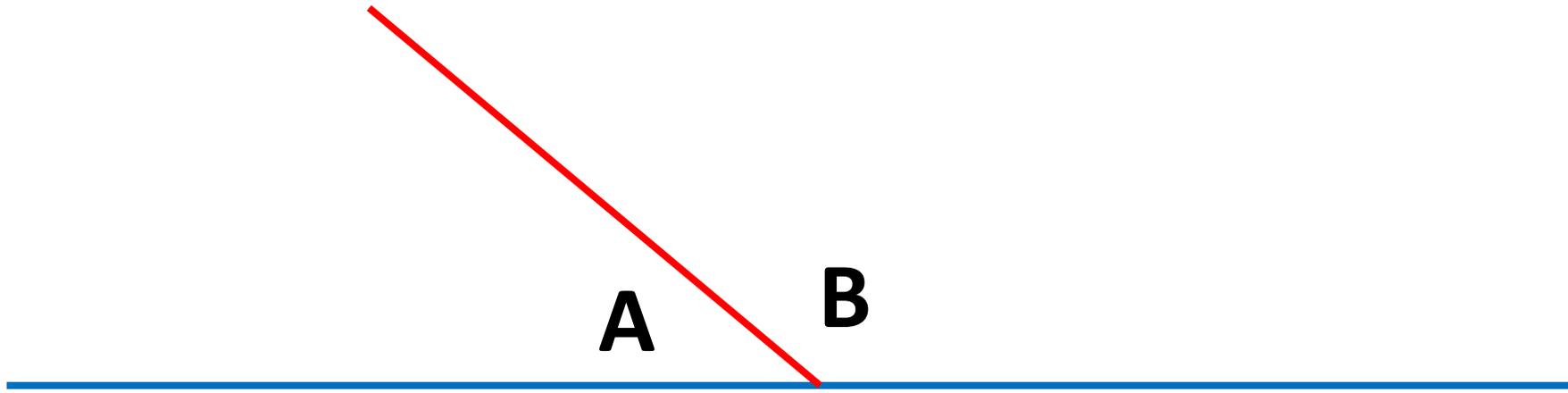
Angles on a straight line
always total 180°

Angles in a full turn
equal 360°

All angles in a triangle
equal 180°

Angles that are
vertically opposite are
always the same $^\circ$

Task 1: Copy these facts into your book



The blue line is a straight line which means all the angles must equal 180° .

$$\text{Angle A} + \text{Angle B} = 180^\circ$$

Task 2: Complete the number sentences

$$\mathbf{A + B = \underline{\hspace{2cm}}}$$

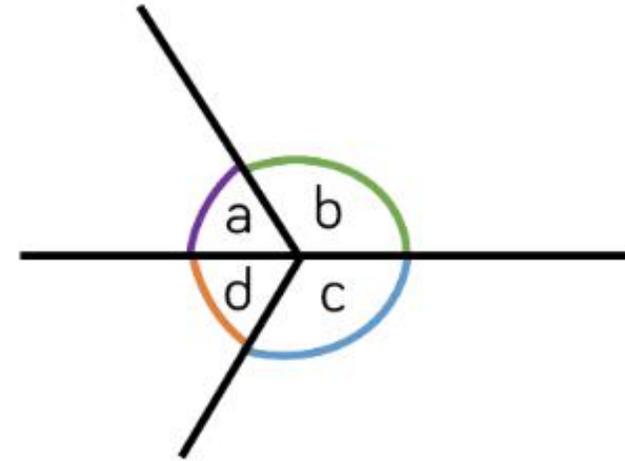
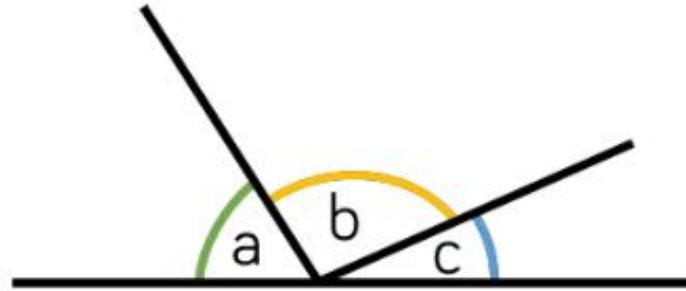
$$\mathbf{B + A + \underline{\hspace{2cm}}}$$

$$\underline{\hspace{2cm}} - \mathbf{A = B}$$

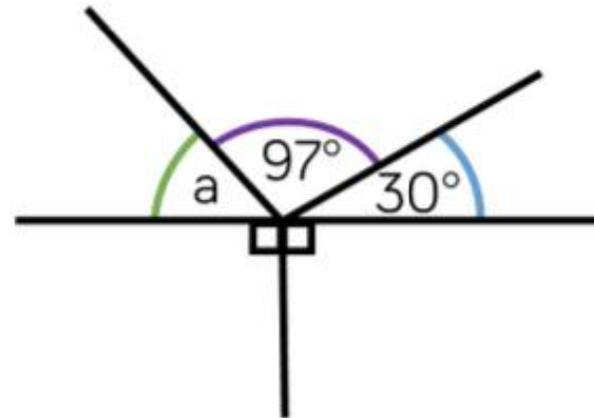
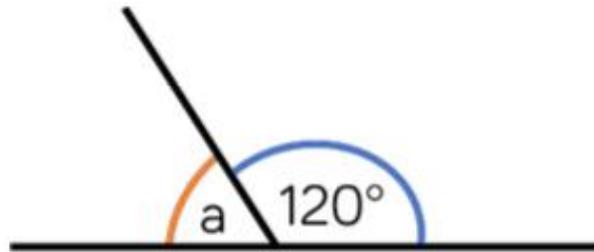
$$\underline{\hspace{2cm}} - \mathbf{B = A}$$

Task 3:

How many number sentences can you write from the images?



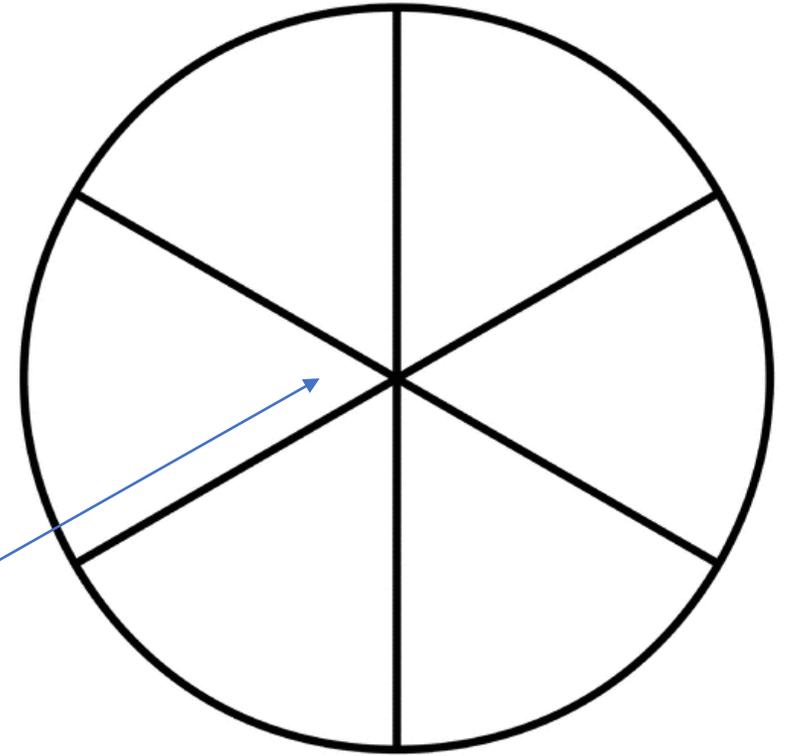
Calculate the missing angles.



If I made 6 equal turns to complete 1 full turn.
It would have looked like the circle to the right.

If I wanted to calculate the angle of each turn, I
would have to divide 360° by 6.

This would be 60° for one turn.



60°

Task 4:

There are five equal angles around a point.

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

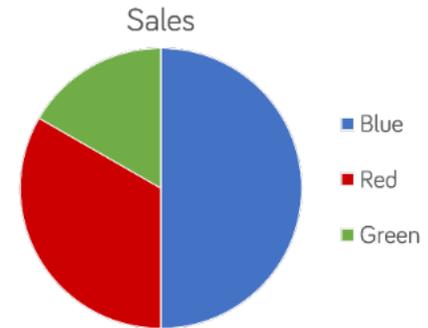
Four angles meet at the same point on a straight line.

One angle is 81°

The other three angles are equal. What size are the other three angles? Draw a diagram to prove your answer.

Task 5:

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



The number of blue cars sold is equal to the total number of red and green cars sold.

The number of red cars sold is twice the number of green cars sold.

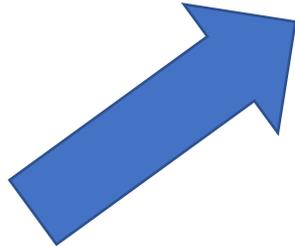
Work out the size of the angle for each section of the pie chart.



Lesson 4 - Thursday

LO: Calculating vertically opposite angles

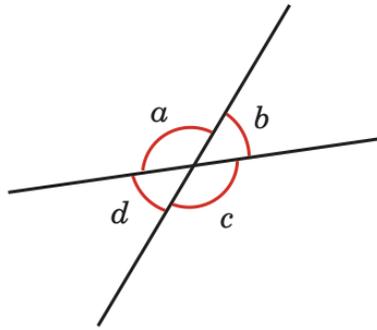
<https://whiterosemaths.com/homelearning/year-6/>



Watch the lesson 1 video and complete the tasks. The tasks are on the next two slides and can also be see on the website.

After that, continue with Lesson 4 on the PowerPoint.

1 The diagram shows four angles formed by two straight lines.



a) Measure the sizes of the angles.

$a =$ $b =$ $c =$ $d =$

b) What is the total of angles a and b ?

Explain why.

Do any other pairs of angles have this same total?

c) Angles a and c are vertically opposite angles.

What do you notice about the sizes of angles a and c ?

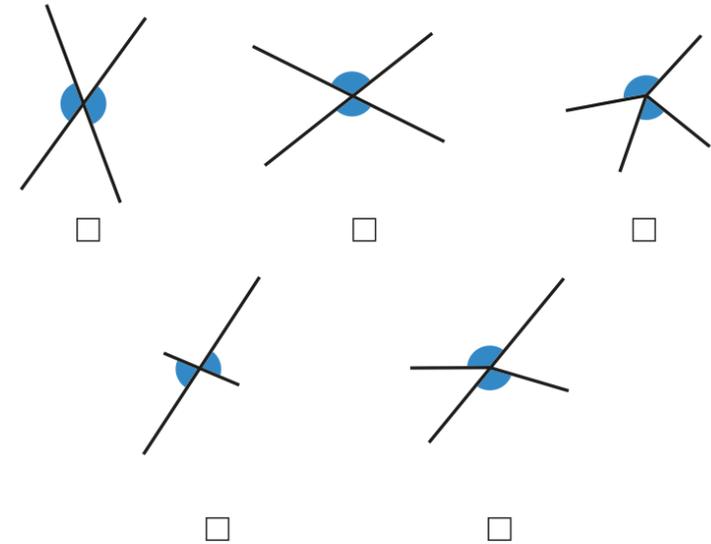
d) Angles b and d are also vertically opposite angles.

What do you notice about the sizes of angles b and d ?

e) Complete the sentence.

Vertically opposite angles _____

2 Tick the pairs of angles that are vertically opposite.

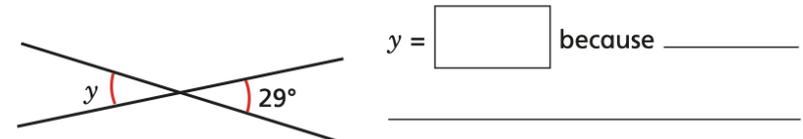


Compare answers with a partner.

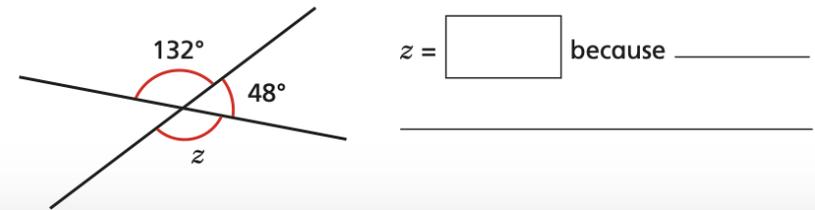
3 Work out the sizes of the unknown angles.

Give reasons for your answers.

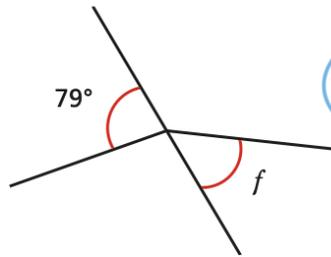
a)



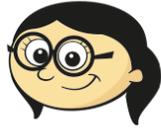
b)



4 Annie is working out the size of angle f .



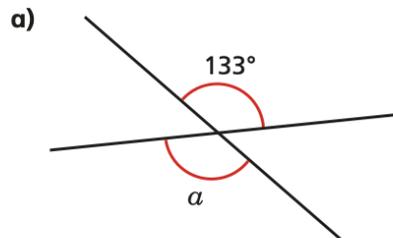
Angle f is equal to 79° because vertically opposite angles are equal.



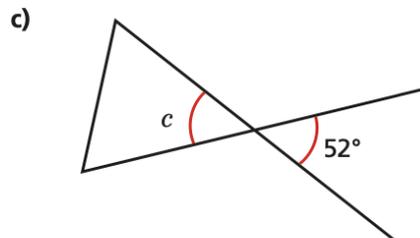
Do you agree with Annie? _____

Explain your answer.

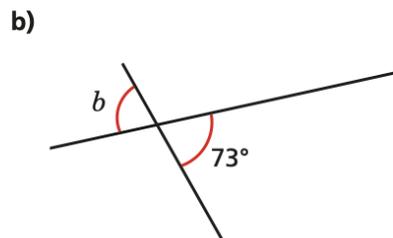
5 Work out the unknown angles.



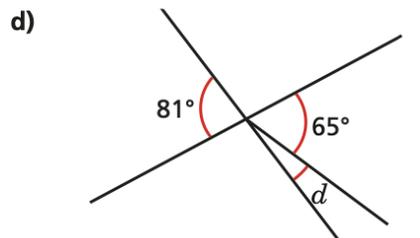
$a = \square$



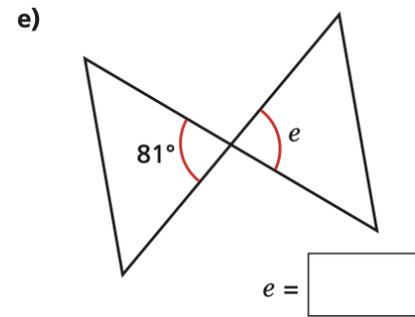
$c = \square$



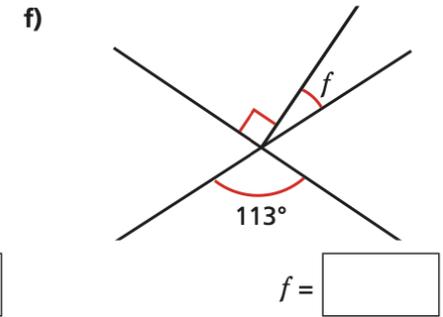
$b = \square$



$d = \square$



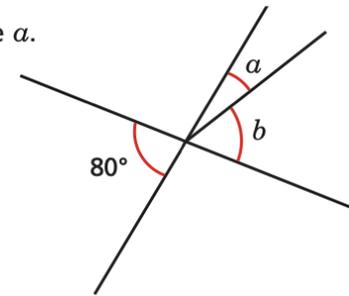
$e = \square$



$f = \square$

Talk about your reasons with a partner.

6 Angle b is three times the size of angle a .



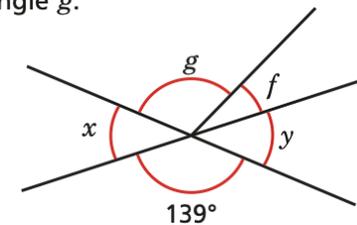
Work out the sizes of angles a and b .

$a = \square$

$b = \square$

7 Angle f is one quarter of the size of angle g .

Angle f is 28° .



Are angles x and y vertically opposite? _____

Explain your answer.

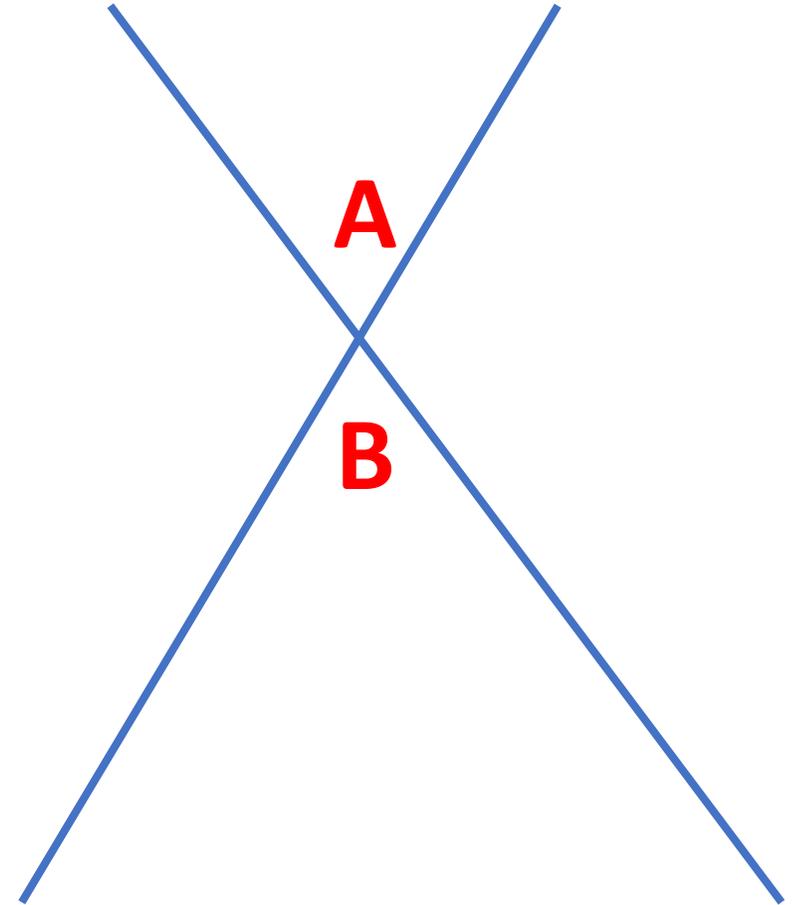


Lesson 4 - Thursday

LO: Calculating vertically opposite angles

Vertically opposite angles share a vertex

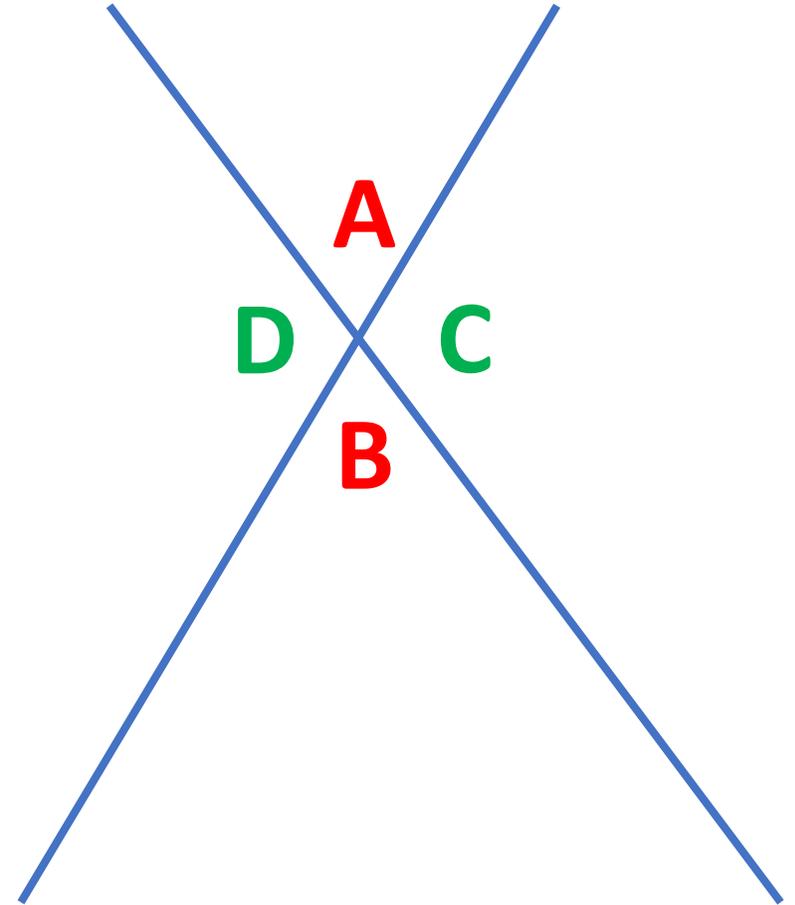
Angle **A** and **B** are the same because they are opposite and share a vertex



Vertically opposite angles share a vertex

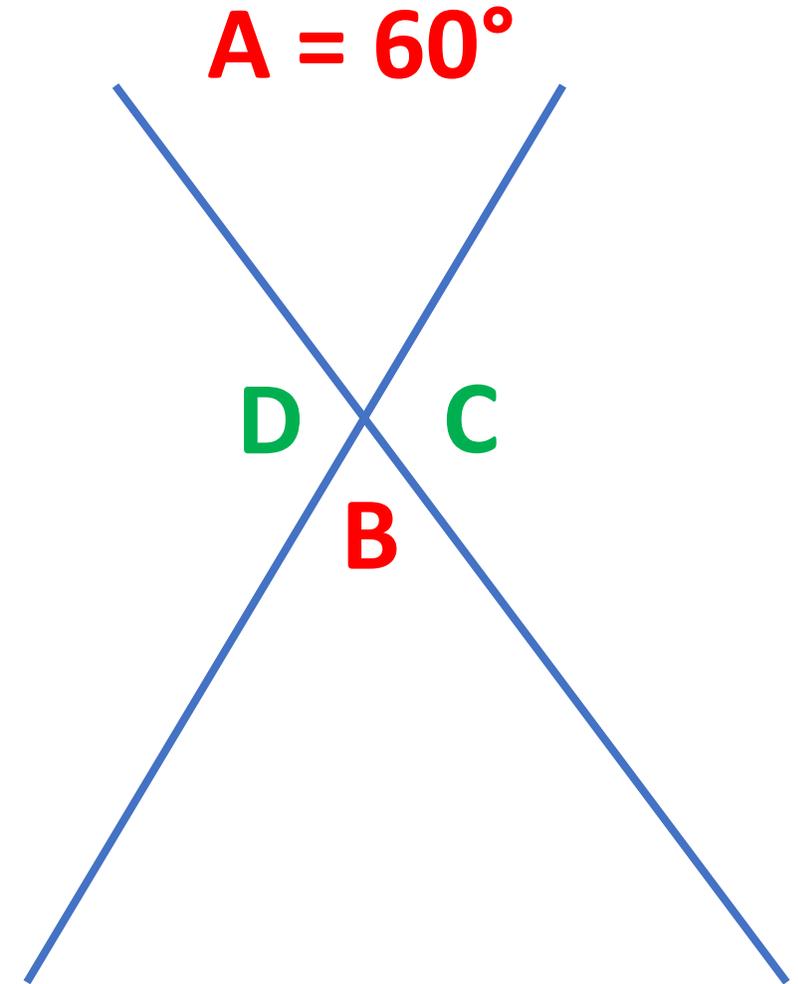
Angle **A** and **B** are the same because they are opposite and share a vertex

Angle **C** and **D** are also the same because they are opposite. It is important to remember that angles A and B do not have to be the same as C and D.



Task 1:

Angle A is 60° . Using what you know about opposite angle and the total number of degrees in a straight line, try to calculate angles, B, C and D.



Task 2:

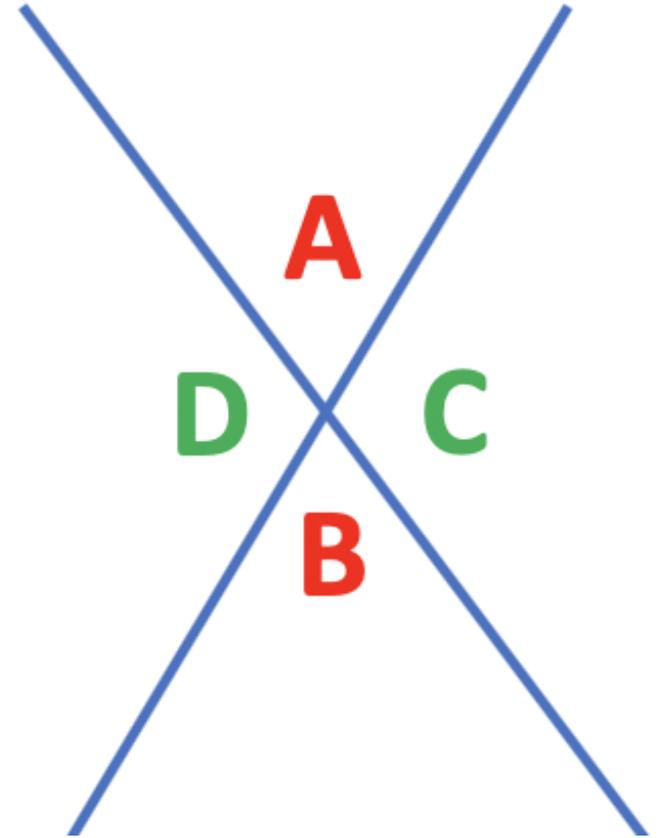
Use the letters in the diagram to complete the number sentences.

$$\underline{\quad\quad} + \underline{\quad\quad} = 180^\circ$$

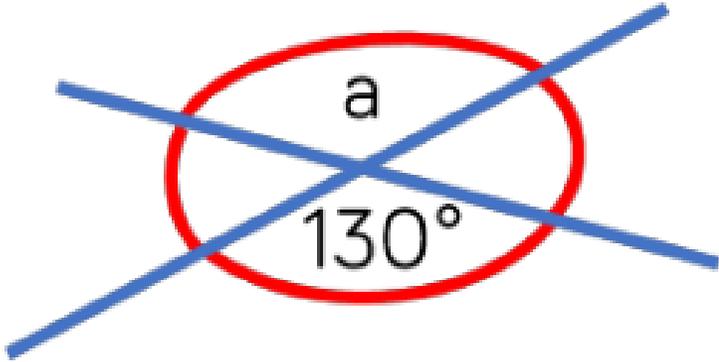
$$\underline{\quad\quad} = \underline{\quad\quad}$$

$$\underline{\quad\quad} + \underline{\quad\quad} = 180^\circ$$

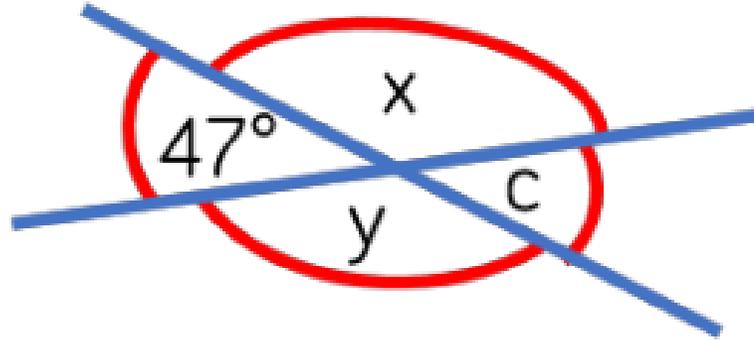
$$\underline{\quad\quad} = \underline{\quad\quad}$$



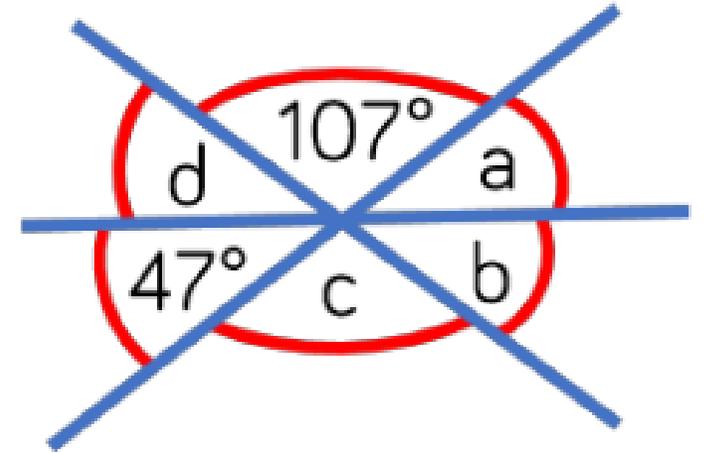
1



2



3



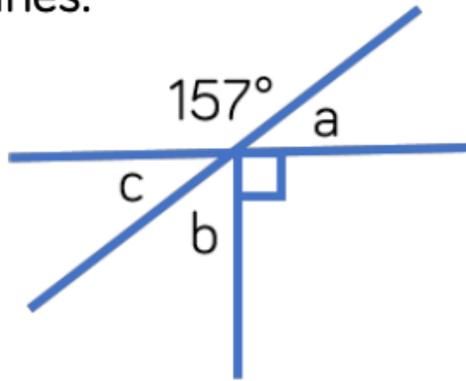
Task 3:

Calculate the missing angles from shapes 1, 2 and 3

- Is there more than one way to find them?

Task 4:

The diagram below is drawn using three straight lines.

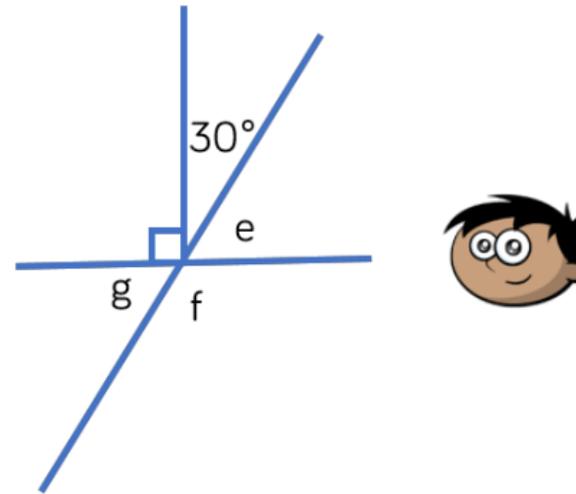


Whitney says that it's not possible to calculate all of the missing angles.

Do you agree? Explain why.

Task 5:

The diagram below is drawn using three straight lines.



Amir says that angle g is equal to 30° because vertically opposite angles are equal.

Do you agree? Explain your answer.

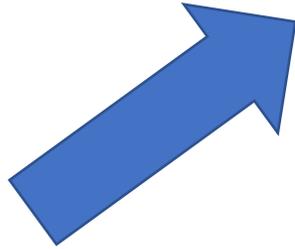
Find the size of all missing angles.
Is there more than one way to find the size of each angle?



Lesson 5 - Friday

LO: Calculating angles in a triangle

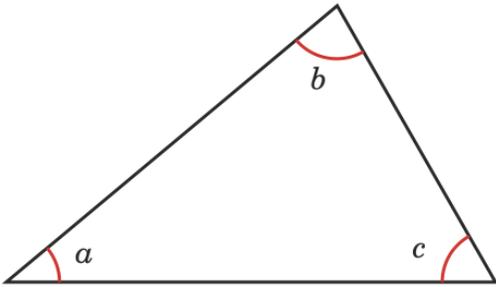
<https://whiterosemaths.com/homelearning/year-6/>



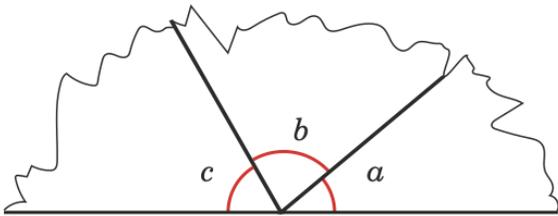
Watch the lesson 2 video and complete the tasks. The tasks are on the next two slides and can also be see on the website.

After that, continue with Lesson 4 on the PowerPoint.

1 Here is a triangle.



a) The three vertices are torn off the triangle and arranged on a straight line.



What is the sum of the three angles?

How do you know?

b) Now measure the sizes of angles a , b and c in the triangle.

$a =$

$b =$

$c =$

c) What is the total of angles a , b and c ?

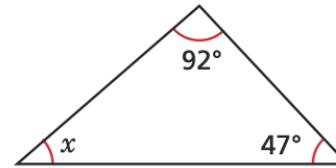
d) Complete the sentence.

Angles in a triangle _____

2 Work out the sizes of the unknown angles.

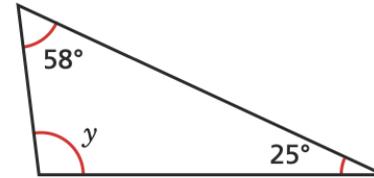
Give reasons for your answers.

a)



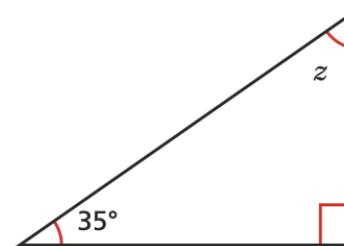
$x =$ because _____

b)



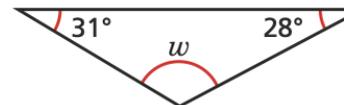
$y =$ because _____

c)



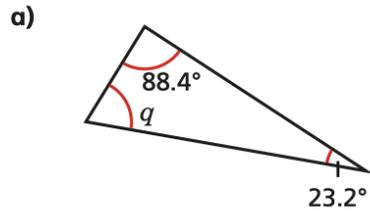
$z =$ because _____

d)

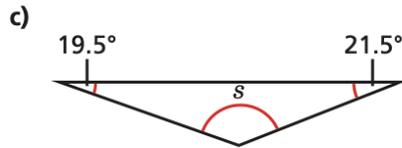


$w =$ because _____

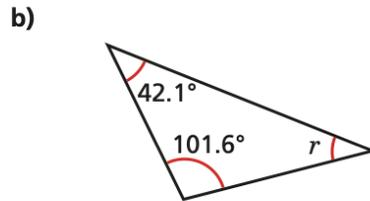
3 Work out the unknown angles.



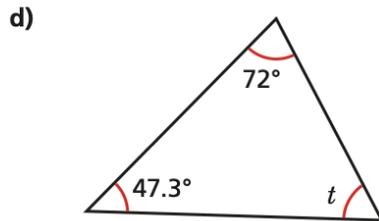
$q =$



$s =$



$r =$



$t =$

Discuss your reasons with a partner.

4 a) Two angles in a triangle are 42° and 57° .

What is the size of the third angle?

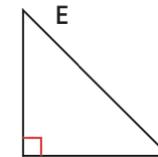
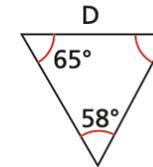
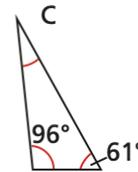
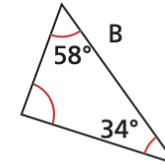
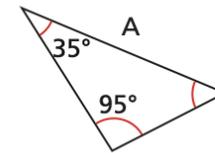
b) Two of the angles in a triangle are 12° .

What is the size of the third angle?

c) One of the angles in a triangle is 38° . Another angle is twice the size of the first angle.

What is the size of the third angle?

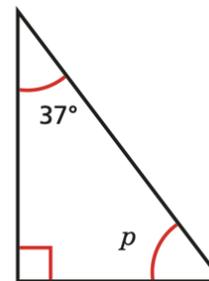
5 Sort the triangles into the table.



0 acute angles	1 acute angle	2 acute angles	3 acute angles

Are any of the columns empty? Why?

6



$p = 143^\circ$ because angles in a triangle sum to 180° and $180 - 37 = 143$



Do you agree with Ron? _____

Explain your answer.



Lesson 5 - Friday

LO: Calculating angles in a triangle



The angles in a triangle
ALWAYS add up to 180°

$$60^\circ + 60^\circ + 60^\circ = 180^\circ$$

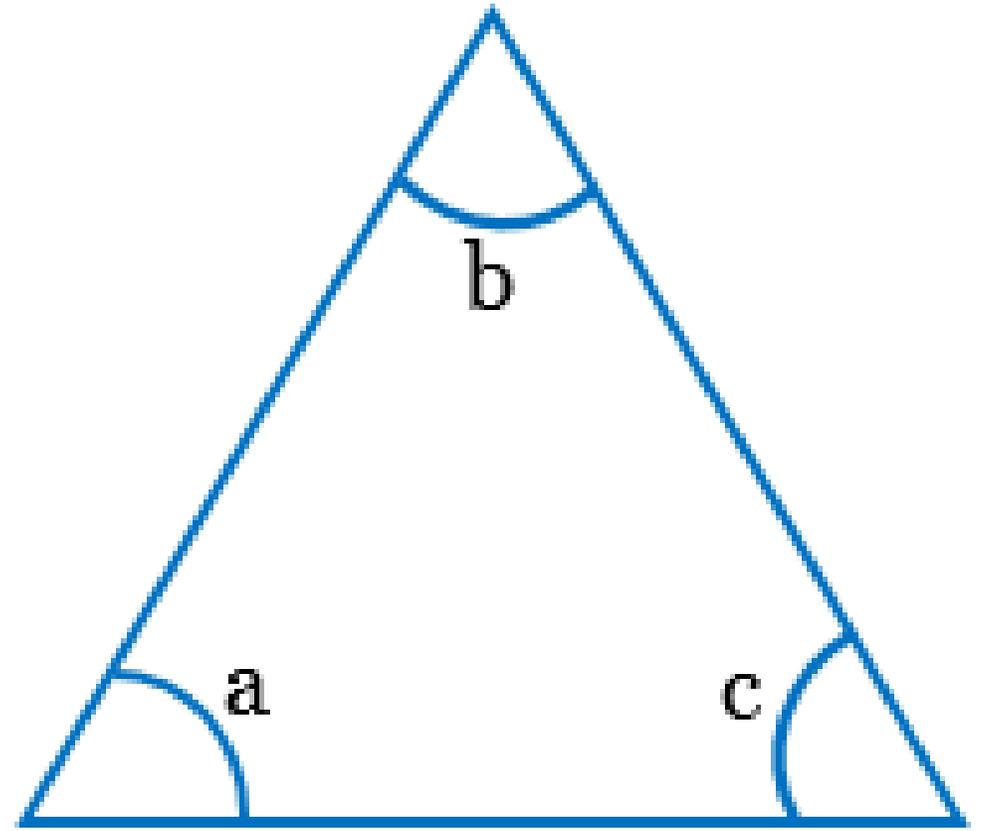
$$30^\circ + 30^\circ + 120^\circ = 180^\circ$$

Task 1:

Write down 5
number
sentences where
the three angles
equal 180°

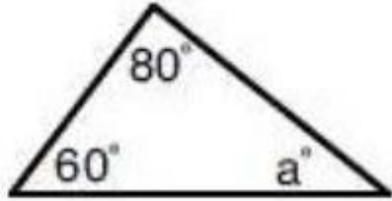
If angle A was 70° and angle B was also 70° I can calculate angle C.

I could do this by subtracting the two angles from 180 ($180 - 70 - 70 = 40$) or I could add the two angles that I know and look for the difference.

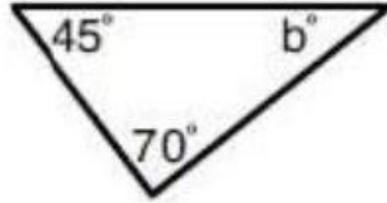


$$a + b + c = 180^\circ$$

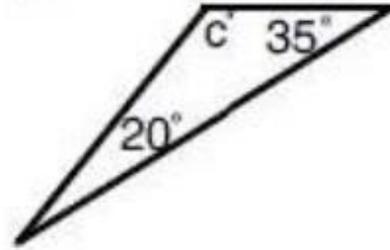
1).



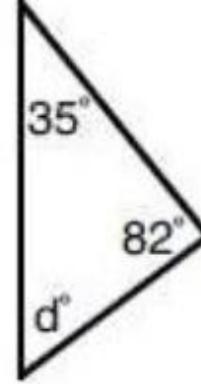
2).



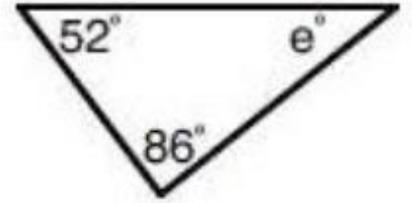
3).



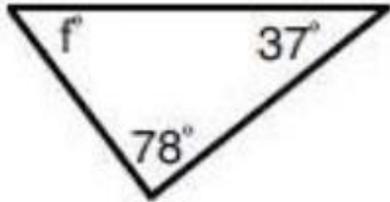
4).



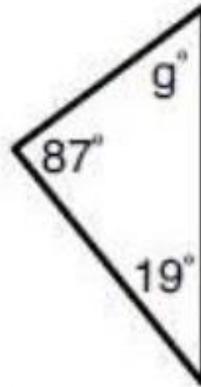
5).



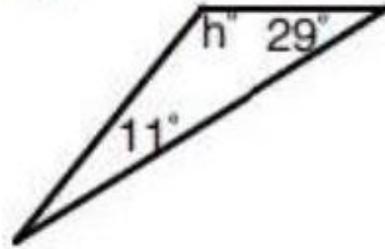
6).



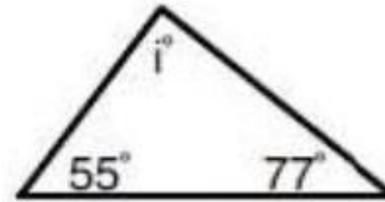
7).



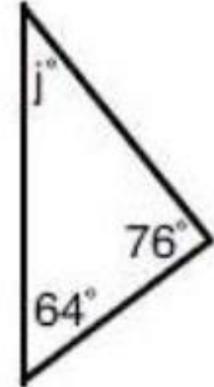
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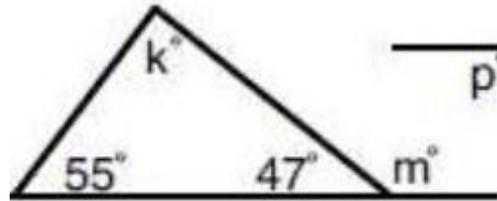
9).



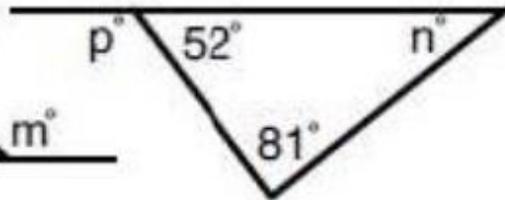
10).



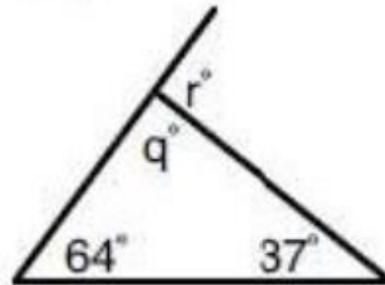
11).



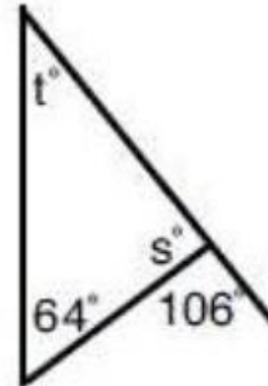
12).



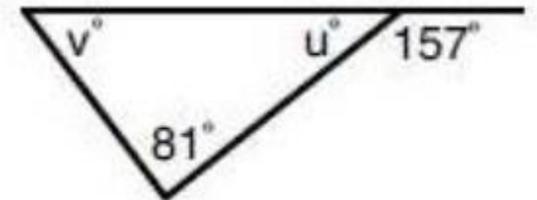
13).



14).



15).



Task 2: Calculate the missing angles in the triangles.

Task 3:

Amir says,

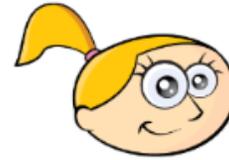


My triangle has two 90° angles.

Can Amir be correct? Can you demonstrate this?

Task 4:

Eva says,



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.

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