

Year 6

Academic Year: 2019 - 2020

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value		Number: Addition, Subtraction, Multiplication and Division				Number: Fractions				Geometry: Position and Direction	Consolidation
Spring	Number: Decimals	Number: Percentages			Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume		Number: Ratio		Consolidation
Summer	Geometry: Properties of Shape		Problem Solving			Statistics		Investigations				Consolidation

Summer 2020

Monday 8th June 2020 - Friday 17th July 2020

Summer	Geometry: Properties of Shape	Problem Solving	Statistics	Investigations	Consolidation
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Summer II 2020

Learning Content for Weekly Planning

Overview

Small Steps

NC Objectives

Measure with a protractor

Introduce angles

Calculate angles

Vertically opposite angles

Angles in a triangle

Angles in a triangle – special cases

Angles in a triangle – missing angles

Angles in special quadrilaterals

Angles in regular polygons

Draw shapes accurately

Draw nets of 3-D shapes

Draw 2-D shapes using given dimensions and angles.

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.

Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Week 3: 22.06.20 - 26.06.20

22.06.20

LO: to use my knowledge of quadrilaterals (and their properties) to explore interior angles.

NB for Parents/Carers:

The answers to each day's lesson will be put up at the end of the working day.

Success Criteria

- to recall the different quadrilaterals
- to recap on the properties of quadrilaterals
- to explore the size of interior angles within them, knowing that they add up to 360°

Am I a Master of My Maths?

Stick the following questions into your book and calculate the answer, showing your working out.

Am I a Master of My Maths?

Instructions:

Fold this sheet of paper into half, stick into your book and complete the questions
Show your working out for each question and make sure you neatly present your work.
Include any and every unit of measure (if applicable).

- A) $1837 \times 5 = 9185 \div \underline{\hspace{1cm}}$
- B) $6x - 26 = 34$
- C) $4.59\text{km} = \underline{\hspace{2cm}} \text{ m}$
- D) $7694 - 4_9_ = 27_9$
- E) If a film starts at 8:40pm and runs for 168 minutes, what time will it finish?

Brain Teaser

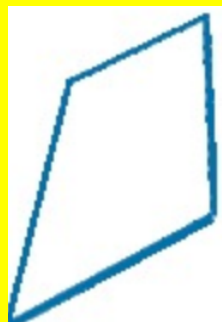
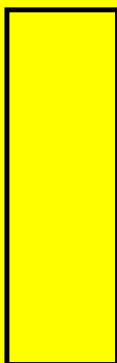
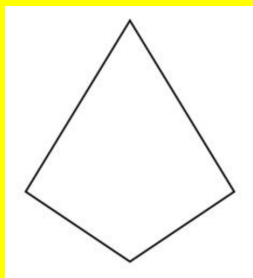
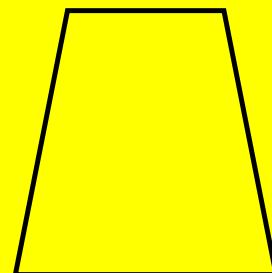
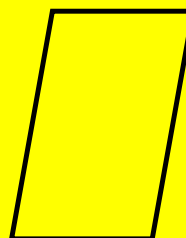
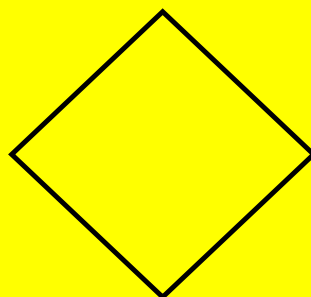
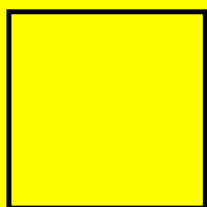


Using the numbers above (ONLY ONCE), create the number in
YELLOW.

You can use any of the four operations.
You may not need to use all of the numbers.

Remember to show your working out.

Match the following shapes to their correct names.



EXT: Describe two features (properties) about each shape - try to find something that is unique about each shape.

Match the following PROPERTIES to the shapes
(hint: some properties may apply to more than one shape).

at least a pair of parallel lines.

4 sides are all the same.

at least one right angle

at least one of the angles are obtuse

two pairs of sides that are the same

not all the sides are the same.

all 4 angles are the same.

sum of adjacent angles = 180°

EXT: What do these shapes ALL have in common?

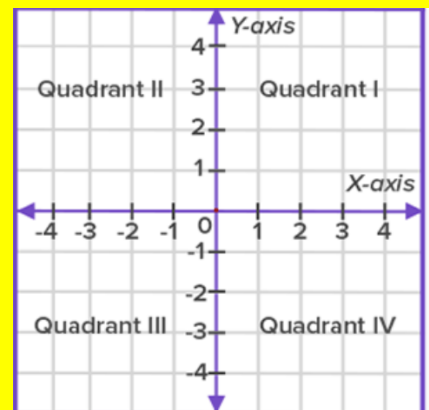
EXT: In your opinion, which shape is, by far, the odd one out and why?

These are all QUADRILATERALS

shapes that are four-sided.



means 'made of four'



Draw any quadrilateral of any size on a piece of paper.

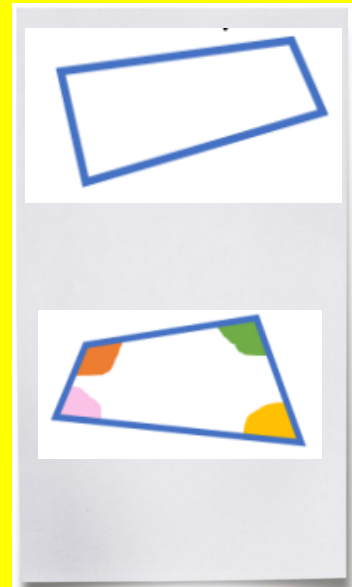
Cut it out.

Measure the INTERIOR angles
(angles within the shape)

What do they add up to?

Repeat the same instructions using a
different quadrilateral.

What do you notice now?



Draw any quadrilateral of any size on a piece of paper.

Carefully tear off the corners and place them together.

Measure those angles

What do they add up to?



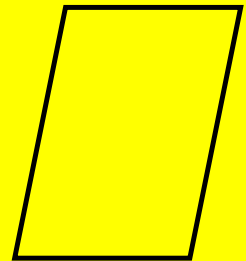
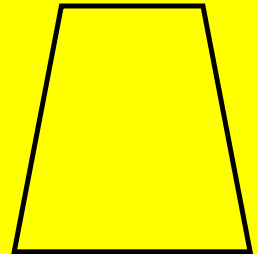
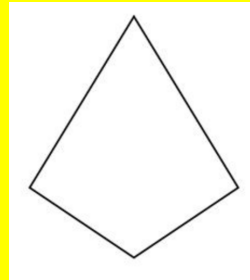
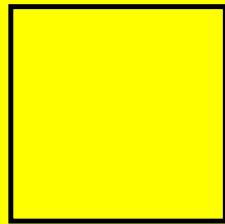
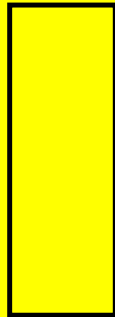
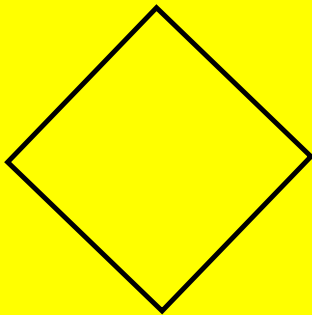
Repeat the same instructions using a different quadrilateral.

What do you notice now?

Create a short chart of similarities and differences based on what you have discovered.

Similarities	Differences

Have a look at the following shapes and use what you notice to create some rules and theories.



Things to consider:

- angles on the same line?
- opposite angles?
- obtuse and acute adding up to 180?

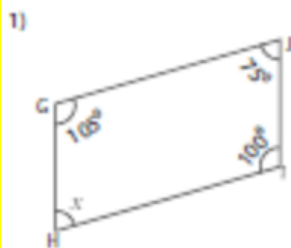
Have a look at the following shapes and use what you notice to create some rules and theories.

Things to consider:

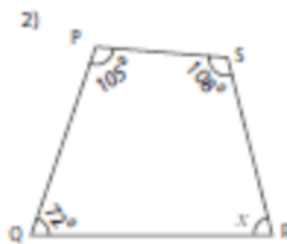
- angles on the same line?
- opposite angles?
- obtuse and acute adding up to 180?

Independent Learning

Calculate the missing angles of the following quadrilaterals.
Show your working out.



$$x = \text{[]}$$



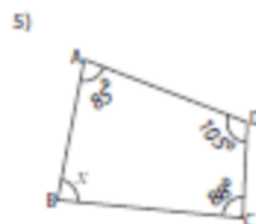
$$x = \text{[]}$$



$$x = \text{[]}$$



$$x = \text{[]}$$



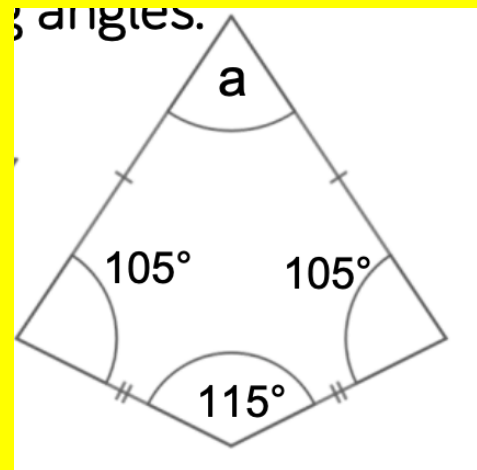
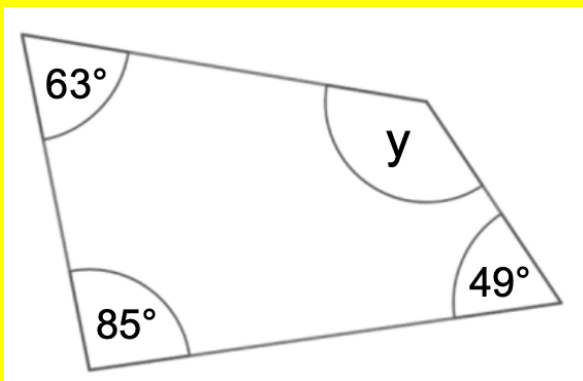
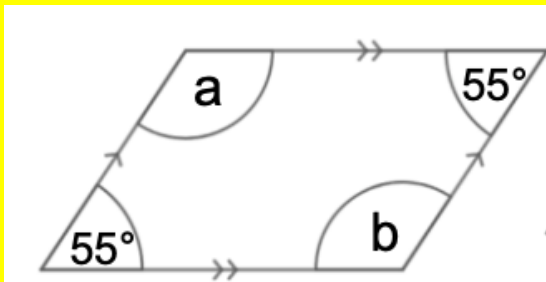
$$x = \text{[]}$$



$$x = \text{[]}$$

Independent Learning

Calculate the missing angles of the following quadrilaterals.
Show your working out.



What is asking us to do (in your own words)?

How do we approach this question?

What mathematical knowledge do we need to know?

Jack says,



All quadrilaterals have at least one right angle.

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

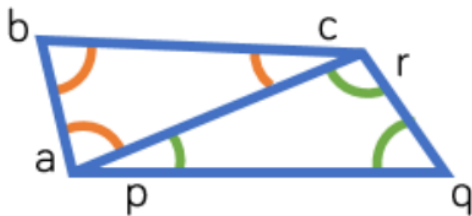
How can we prove that Jack is wrong?

What is asking us to do (in your own words)?

How do we approach this question?

What mathematical knowledge do we need to know?

This quadrilateral is split into two triangles.

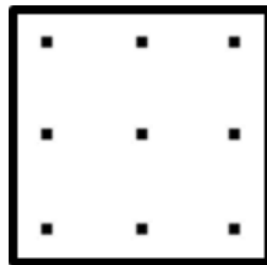


Use your knowledge of angles in a triangle to find the sum of angles in a quadrilateral.

Extension:

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

How many quadrilaterals can you make on the geoboard?



Identify the names of the different quadrilaterals.

If your geoboard was 4×4 , would you be able to make any different quadrilaterals?

What do you notice about the angles in certain quadrilaterals?

Guess Who?

Use the following clues to guess the quadrilateral that I am thinking of

Be prepared to explain your reasoning as to why you think it is that particular shape.

23.06.20

LO: to use my knowledge of polygons (and their properties) to explore interior angles.

Success Criteria

- to know what a polygon is
- to identify a specific polygon based on their properties
- to understand the relationship between the number of sides and the sum of interior angles

Am I a Master of My Maths?

Stick the following questions into your book and calculate the answer, showing your working out.

Challenge A

Topics include:

- balancing equations
- solving algebraic equations
- measurement
- missing number problems
- calculating time intervals

Challenge B

Topics include:

- long division
- algebraic substitution
- mixed numbers and improper fractions
- missing number problems
- calculating time intervals

Maths Brain Teaser

Explain your reasoning.

Complete the table with information about the following shapes:

Remember to provide your own definition to the key vocabulary.

Mathematical Vocabulary:

Polygon

Symmetry

Quadrilateral

Irregular

Orientation

Regular

Remember to provide your own definition to the key vocabulary.

What does it mean to be 'regular'?
....to be 'irregular'?

Split these shapes into regular and irregular and be able to provide an explanation as to why they are.

Regular Polygons

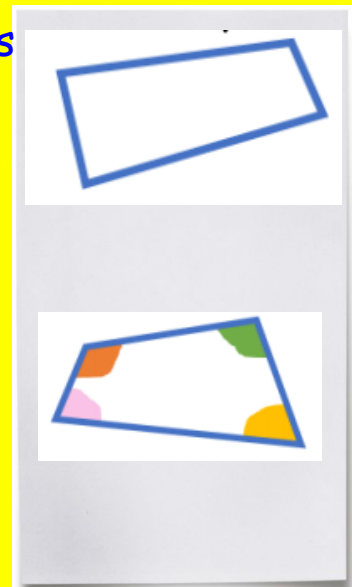
Irregular Polygons

Draw any shape from the list that you have

Cut into it so you have two separate triangles

What do you think the angles in that shape add up to?

How do you know?



Repeat the same instructions using a different shape? Possibly one with more sides.

Partition it so you have as many triangles as possible.

What do you notice now?

Use your practical working to complete the table of information below.

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

Do you notice any patterns?

Can you predict the sum of internal angles?

The sum of the interior angles within a polygon can be calculated by multiplying the number of triangles made within the shape and 180.

Mr Semra's Example:

What is asking us to do (in your own words)?
How do we approach this question?

What mathematical knowledge do we need to know?

Use the clues to work out what shape each person has.

Dora



My polygon is made up of 5 triangles.

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

Tommy



Alex



The sum of my angles is equivalent to the sum of angles in 3 triangles.

What is the sum of the interior angles of each shape?

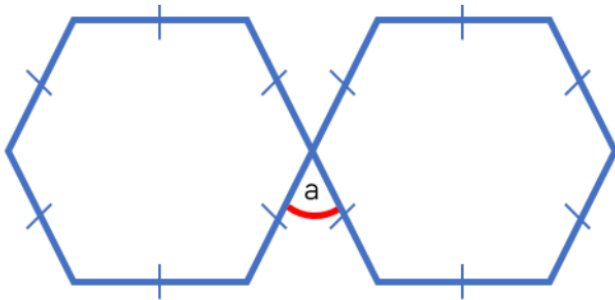
How can you prove that your shape is correct?

What is asking us to do (in your own words)?

How do we approach this question?

What mathematical knowledge do we need to know?

Here are two regular hexagons.



The interior angles of a hexagon sum to 720°

Use this fact to work out angle a in the diagram.

How do we work out the answer?

Extension:

Is there another way that you can solve the question?

25.06.20

LO: to construct and draw shapes accurately using appropriate measuring tools (ruler).

Success Criteria

- to recall the properties of a variety of 2D shapes
- to use a ruler accurately to draw a variety of 2D shapes
- to explore the use of a protractor to create specific angles when constructing shapes.

Am I a Master of My Maths?

Stick the following questions into your book and calculate the answer, showing your working out.

Challenge A

Topics include:

- balancing equations
- solving algebraic equations
- measurement
- missing number problems
- calculating time intervals

Challenge B

Topics include:

- long division
- algebraic substitution
- mixed numbers and improper fractions
- missing number problems
- calculating time intervals

Maths Brain Teaser

Remember to explain your reasoning behind your answers

What strategies/top tips do you have when it comes to drawing shapes accurately?

Create a bullet-pointed list of tips.

-
-
-
-

Extension:

Why would someone not be able to accurately draw?
Give reasons.

Starter Activity

Use the instructions and accurately draw/construct the following figures:

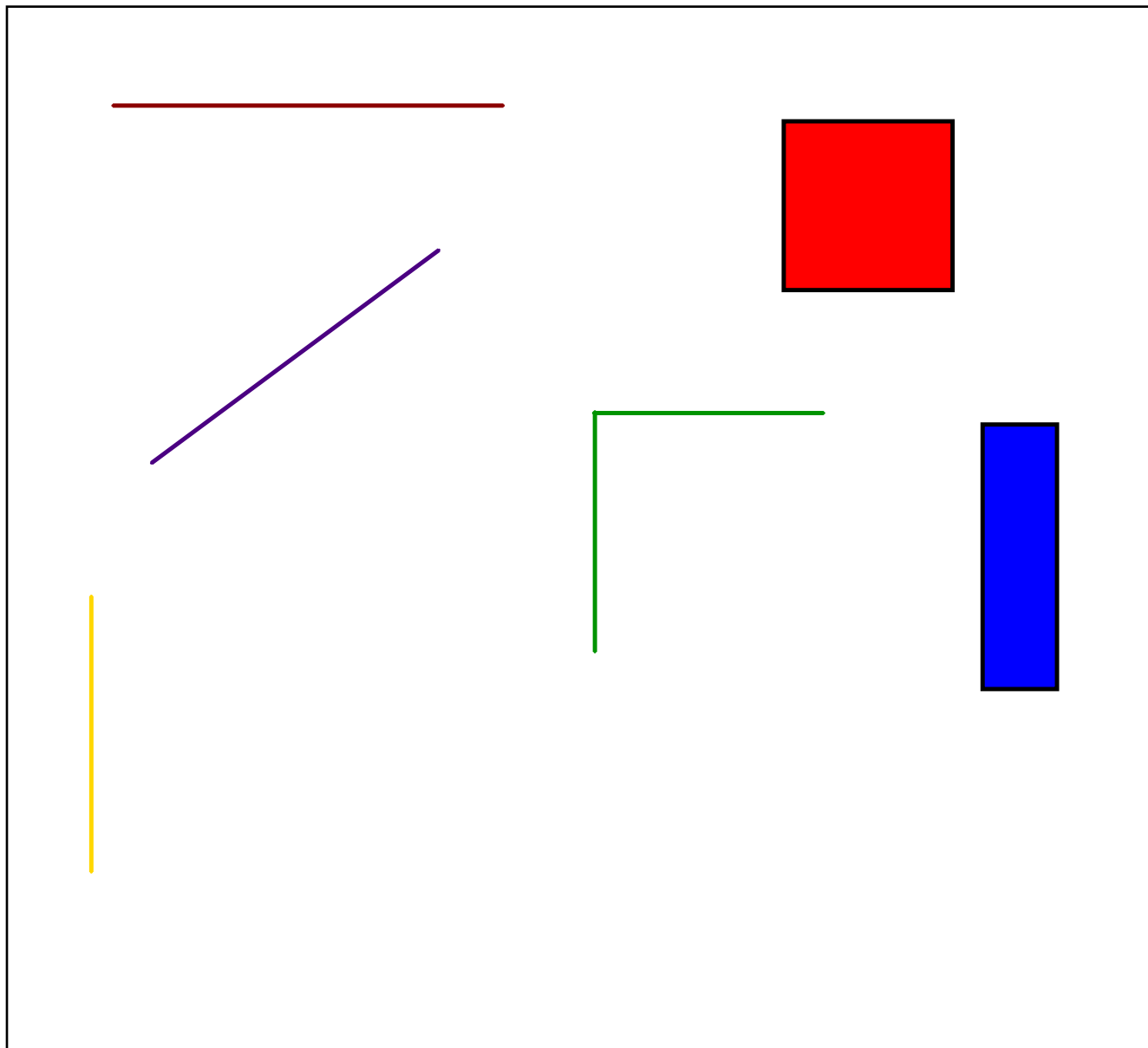
- 1) a horizontal line that is exactly six 'squares' long
- 2) a vertical line that is twelve centimetres
- 3) a diagonal line that is 148mm long
- 4) a right angle (perpendicular lines) where one line is 49mm and the other line is triple its size.
- 5) a square with the perimeter of 22cm
- 6) a rectangle with a perimeter of 36cm

Peer Assess

Assess your partner's attempts and give them a grade on the following:

- have they drawn what is required of (e.g. line, square)?
- have they drawn the right direction (vertical, horizontal)?
- have they accurately drawn the right measurements?
- have they labelled their drawing and measurement?

Give them a final grade (A, B or C) and identify their strengths and areas of development.



Here's a helping hand...

If I said that you are going to draw the following...

What information will/do you need of those shapes in order to be able to draw them?

What information will you need to consider?

Independent Task

On a piece of squared paper, accurately draw the shapes.

- A square with perimeter 16 cm.
- A rectangle with an area of 20 cm^2 .
- A right-angled triangle with a height of 8 cm and a base of 6 cm.
- A parallelogram with sides 3 cm and 5 cm.

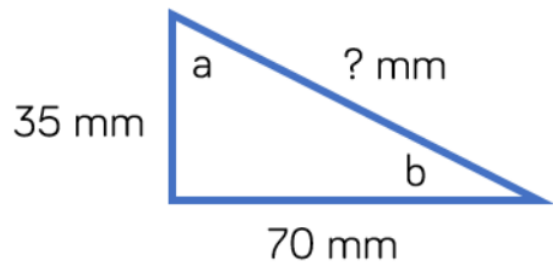
How can you double check and ensure that your measurements are accurate?

Extension

Draw a trapezium with measurements of 4cm, 6cm and 8cm

Independent Task

Draw the triangle accurately on squared paper to work out the missing length. Measure the size of angles A and B.

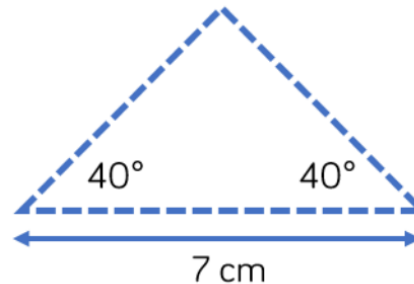


How can you double check and ensure that your measurements are accurate?

Drawing Shapes with Angles

Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



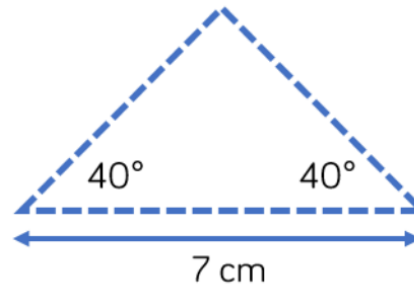
Have a go at recreating this shape and record each step that you have taken to do this.

- how did you do it?
- what did you focus on drawing first?
- did you come across any problems?
- did you have to restart or approach the task differently? if so, why?

Drawing Shapes with Angles

Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.

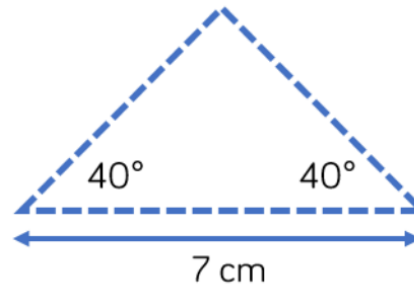


Children's Steps:

Drawing Shapes with Angles

Rosie has been asked to draw this triangle on plain paper using a protractor.

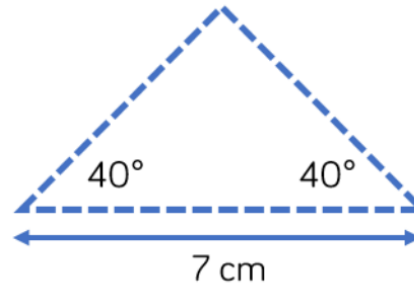
Create a step-by-step plan to show how she would do this.



Children's Steps:

Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



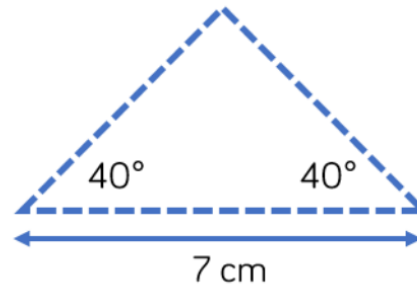
Step One:

Draw the given line of 7cm accurately.



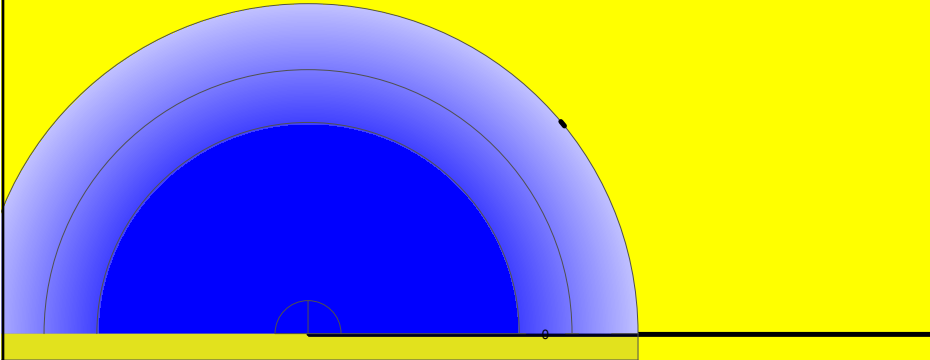
Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



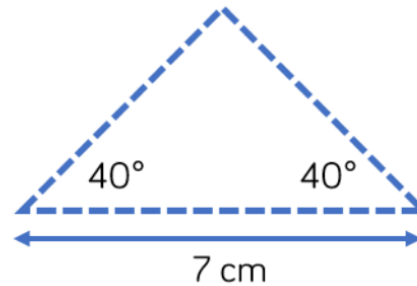
Step Two:

Use your protractor to measure an angle of 40 degrees - place a dot above.



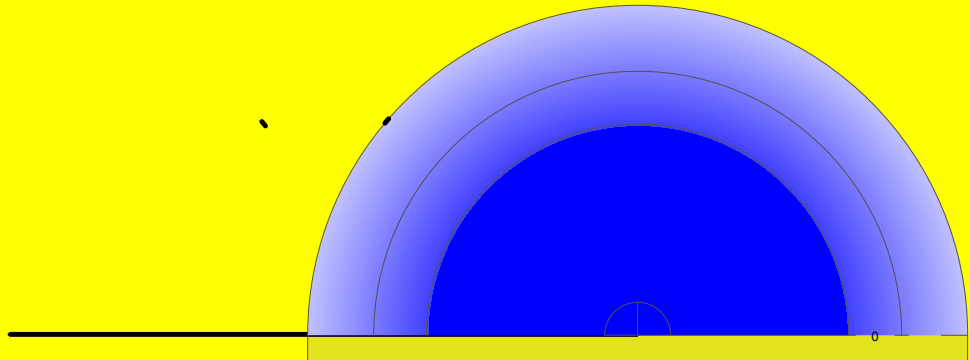
Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



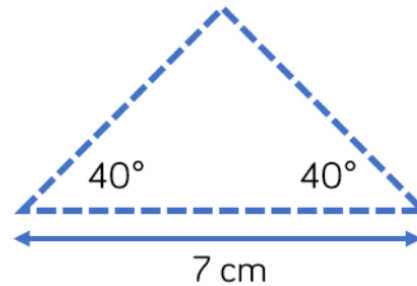
Step Three:

Measure 40 degrees on the other side, too.



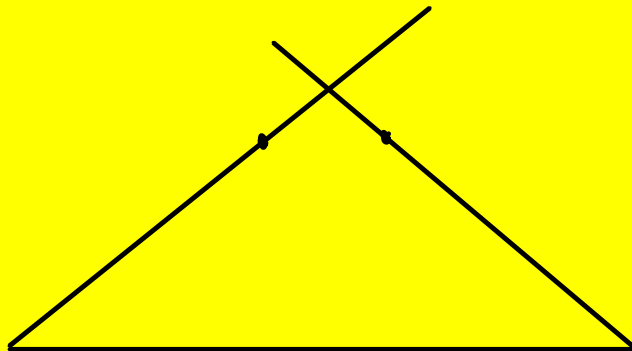
Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



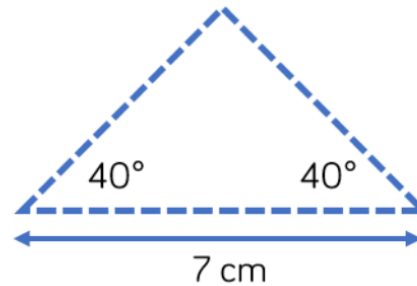
Step Four:

Draw the lines up to the dots so that they cross over.



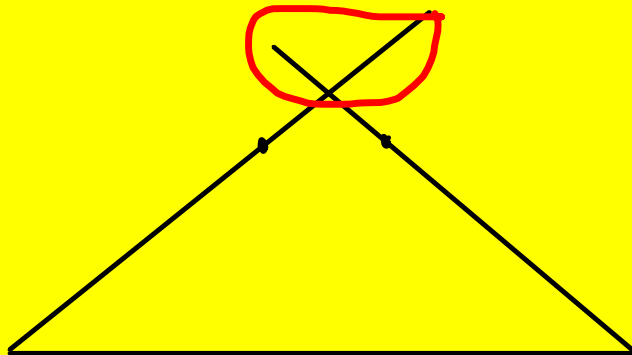
Rosie has been asked to draw this triangle on plain paper using a protractor.

Create a step-by-step plan to show how she would do this.



Step Five:

Rub out the 'extra bit' so that it looks like a triangle.
What triangle should it be based on the measurements?



Check that we have done it correctly using a protractor and ruler.

Drawing Shapes with Angles

Construct a scalene triangle which has a side length of 9cm and one of its angles being 104°

Construct a parallelogram which has its side lengths as 42mm and one of its angles being 72°

- how did you do it?
- what did you focus on drawing first?
- did you come across any problems?
- did you have to restart or approach the task differently? if so, why?

26.06.20

LO: to construct and draw shapes accurately using appropriate measuring tools (ruler and protractor).

Success Criteria

- to explore the use of a protractor to create specific angles when constructing shapes.
- to apply my understanding of shape properties and angle sums to construct different shapes accurately.

Am I a Master of My Maths?

Stick the following questions into your book and calculate the answer, showing your working out.

Challenge A

Topics include:

- balancing equations
- solving algebraic equations
- measurement
- missing number problems
- calculating time intervals

Challenge B

Topics include:

- long division
- algebraic substitution
- mixed numbers and improper fractions
- missing number problems
- calculating time intervals

Maths Brain Teaser

Remember to explain your reasoning behind your answers

What Went Wrong?

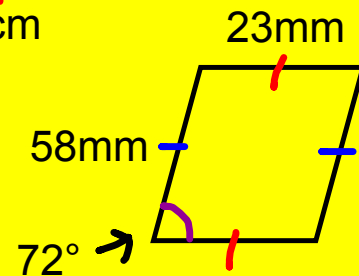
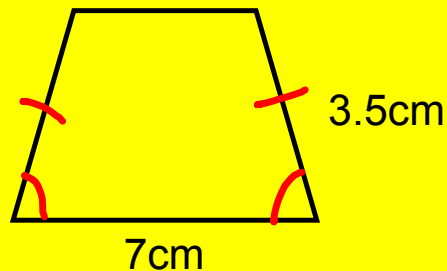
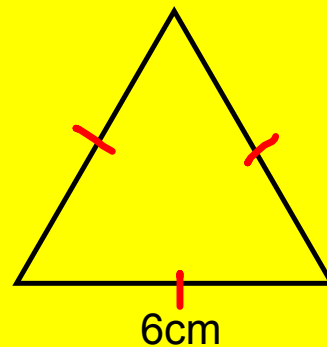
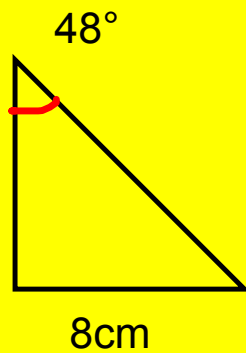
Have a look at the following shapes - identify which ones have been measured correctly, according to the criteria given.

Give a possible reason as to why the mistakes have been made.

See if you can correct it by constructing the correct version.

Independent Activity

Use the instructions and accurately draw/construct the following figures:



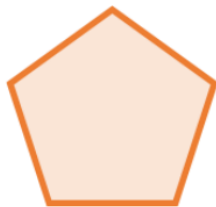
Which shapes were easy/difficult to construct?
Why do you think?

What is asking us to do (in your own words)?

How do we approach this question?

What mathematical knowledge do we need to know?

What is the size of each interior angle of the regular shape below.



Accurately draw a regular pentagon with side length 5 cm.

What is the first thing to do when accurately drawing this out?

What is asking us to do (in your own words)?
How do we approach this question?

What mathematical knowledge do we need to know?

Eva has drawn a scalene triangle.
Angle A is the biggest angle.
Angle B is 20° larger than angle C.
Angle C is the smallest angle, and it is 70° smaller than angle A.

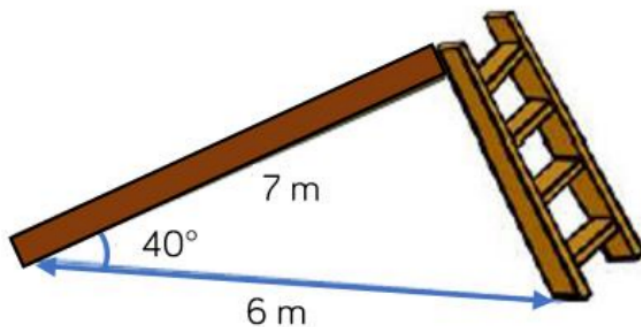
Use a bar model to help you calculate the size of each angle, then construct Eva's triangle.

Will our diagram be exactly 6m long? Why not?

What is asking us to do (in your own words)?
How do we approach this question?

What mathematical knowledge do we need to know?

Mr Harrison is designing a slide for the playground.



Will our diagram be exactly 6m long? Why not?

Use a scale of 1 cm to represent 1 m.

Draw a scale diagram.

Use the diagram to find out how long Mr Harrison needs the ladder to be.

