

# Unit 15

## Problem solving



In this unit we will ...

- ⚡ Solve problems about numbers, including fractions and ratios
- ⚡ Use representations to help make sense of problems
- ⚡ Use the four operations flexibly
- ⚡ Reason about problems with a context and without a context
- ⚡ Apply our understanding of measurement and geometry to solve problems

In previous units, we used the four operations to solve calculations. Which operations do you need to find the value of the triangle?

$$\triangle + \triangle - 120 = 300$$

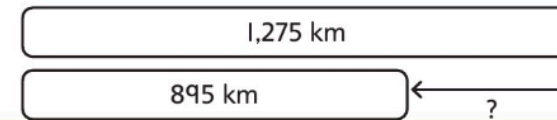


We will need some maths words. Which ones do you remember?

- partition
- estimate
- round
- compare
- equivalent
- percentage
- ratio
- proportion
- convert
- common denominator
- coordinates
- translation
- reflection
- vertex
- scaling
- isosceles triangle

We will also use bar models and number lines.

What values do the question marks represent in the number line and bar model below?



# Unit 8

## Algebra



In this unit we will ...

- ⚡ Find and write algebraic rules
- ⚡ Write algebraic expressions
- ⚡ Write algebraic formulae
- ⚡ Write and solve algebraic equations
- ⚡ Solve equations that have lots of solutions

Do you remember what this model is called? We will use it to represent different equations. Can you predict what equation is being represented here?

36	x
42	



We will need some maths words. Can you identify and explain the words you already recognise?

- sequence
- rule
- term
- algebra
- expression
- calculation
- formula
- substitute
- generalise
- operation
- calculate
- equation
- solution

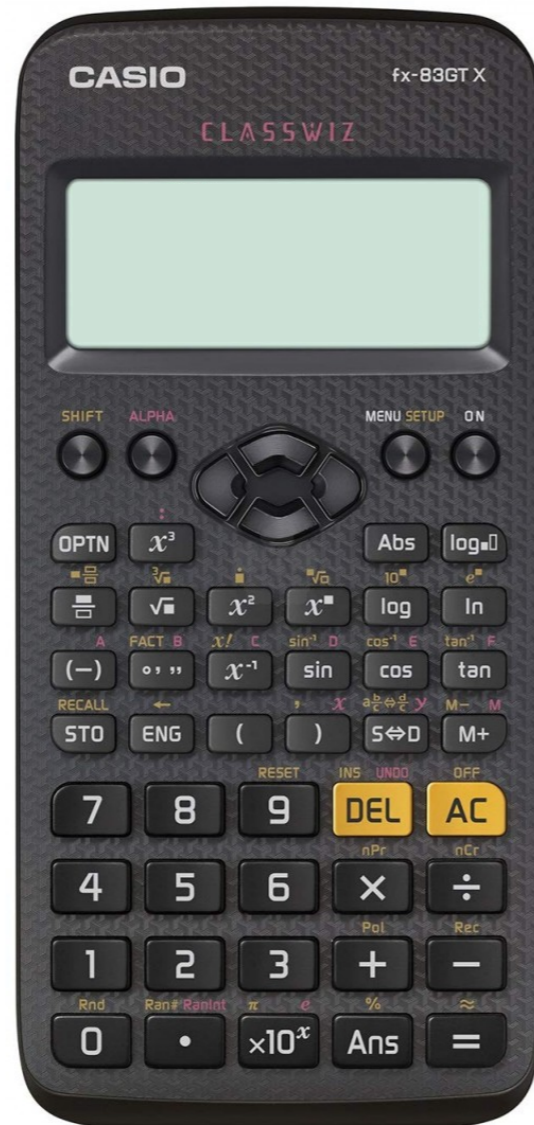
We will need to work systematically to find all the solutions to one equation. We can use a table to help us order and record our solutions.

Perimeter of rectangle	If $a =$	Then $b =$
20	$a = 1$	$20 \div 2 - 1 = 9$
20	$a = 2$	$20 \div 2 - 2 = 8$
20	$a = 3$	$20 \div 2 - 3 = 7$







# Using a scientific calculator


- Numbers
- Four operations
- Equals
- Brackets
- Fraction and mixed fraction (use shift)
- Squared button
- Cubed button
- Any power or index
- Percentage button



## General Buttons


There are some general buttons that may be new to you but to get the best out of your calculator, you should aim to master these.

	<p>This is usually the first button on the left underneath the screen; it has SHIFT written above it. It may be written in yellow. Pressing the Shift button means you will select the instruction written above the next button you press, rather than what is written on the button itself.</p>
	<p>The replay button has four arrows on it and allows you to direct your cursor on-screen. It's really useful if you enter a large calculation incorrectly, as you can use the arrows to go back and insert or remove characters. Replay also allows you to move between the numerator and denominator when you're working with fractions, or to move out of a root or index.</p>
	<p>The delete button erases characters; when you press it, the character to the left of the cursor will be erased. It can be useful to fix a calculation, when used with the replay button.</p>
	<p>The Ans button can be used to put an answer you have just found back into your next calculation.</p>




You should input negative numbers into your calculator using (-). When using this button, the brackets won't appear on the display.

**Top Tip:**  
Be careful when inputting any negative numbers which are raised to a power.




The SD button changes the form of your answer from a decimal or standard form to either a fraction, a surd or an answer in terms of  $\pi$ , depending on the result. Each time you press it, you'll get the answer in a different form.


If you press **SHIFT** then SD, improper fractions will be converted into mixed numbers and vice versa.



This button allows you to square numbers.



This button allows you to square root numbers. Additionally, you can press shift followed by the  $\sqrt{\square}$  button to enter cube roots ( $\sqrt[3]{\square}$ ). Before you continue entering your calculation, you must use the right arrow on the replay button to move out of the root symbol.



This button allows you to cube numbers.

# Unit II



## Measure – perimeter, area and volume

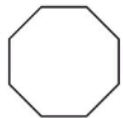


In this unit we will ...

- ⚡ Find and draw shapes with the same area or perimeter
- ⚡ Explore how the perimeter changes when the area changes and vice versa
- ⚡ Calculate the area of parallelograms and triangles
- ⚡ Calculate and estimate the volume of cubes and cuboids

This regular octagon and regular hexagon have the same perimeter. What is the length of one side of the hexagon?

6 cm



Here are some maths words we will be using. Which words are new?

area volume perimeter

parallelogram height perpendicular

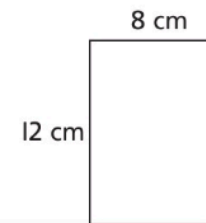
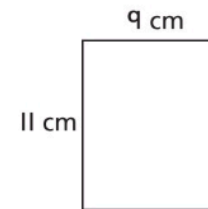
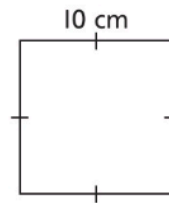
width length square centimetres (cm<sup>2</sup>)

square metres (m<sup>2</sup>) base estimate

formula compound shape dimensions

cubic centimetres (cm<sup>3</sup>) cubic metres (m<sup>3</sup>)

Describe the pattern. Draw the next shape. Which shape has the largest perimeter? Which has the largest area? How do you know?



# Unit 13

## Geometry – properties of shapes



We will need some maths words. Which ones do you recognise? What do they mean?

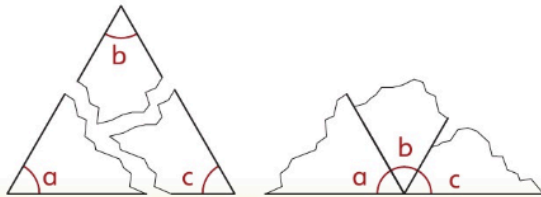
- degree angle obtuse acute reflex
- right angle protractor triangle isosceles
- isometric equilateral scalene regular polygon
- quadrilateral parallelogram kite rhombus trapezium
- diameter radius circumference concentric perimeter
- nets pyramid tetrahedron cylinder prism
- vertically opposite angles cuboid cube



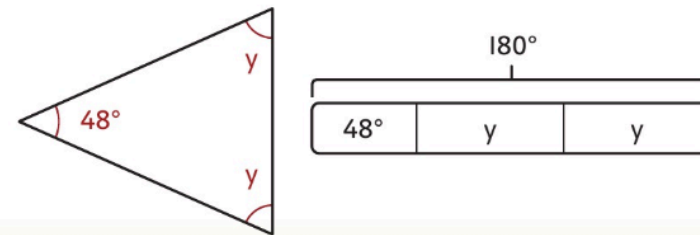
In this unit we will ...

- ⚡ Measure angles and draw shapes accurately using a ruler and protractor
- ⚡ Calculate unknown angles in shapes and on lines using angle facts
- ⚡ Explore properties of polygons and circles
- ⚡ Identify 3D shapes from 2D representations
- ⚡ Draw multiple nets for a 3D shape

How can you use your knowledge of angles on a straight line to work out what the interior angles of a triangle add up to?



We also need to be able to use bar models to calculate unknown angles. How can you work out the size of this angle without measuring?



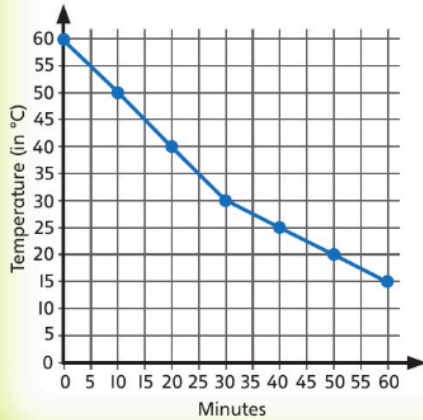
# Unit 12

## Statistics



In this unit we will ...

- ⚡ Interpret and create line graphs and bar charts
- ⚡ Read and interpret pie charts using fractions
- ⚡ Read and interpret pie charts using percentages
- ⚡ Learn to calculate the mean of a set of data
- ⚡ Use the mean to find missing data



We will be interpreting line graphs.  
Here is a line graph that shows the temperature of a hot chocolate drink that was left to cool.  
What was the temperature of the hot chocolate after 10 minutes?



We will need some maths words. Which ones do you recognise?

- mean
- average
- pie chart
- segments
- line graph
- bar chart
- percentage
- fraction
- data

We need to know that the angles around a point add up to 360°. Calculate the missing angle.

