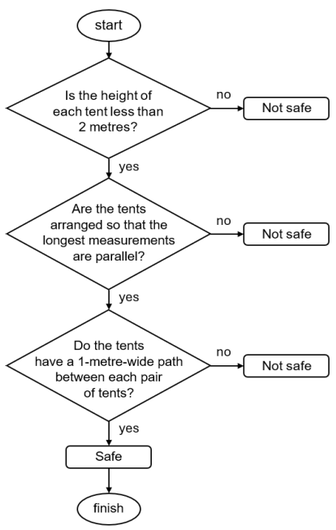
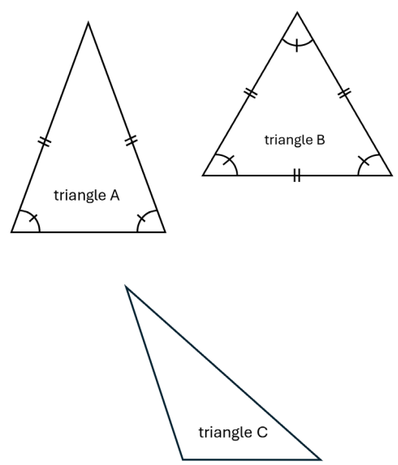
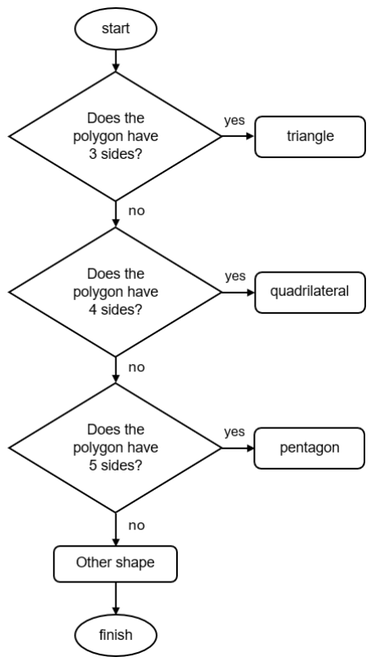
Year 7 Mathematics

ACiQ v9.0

Australian Curriculum v9.0: Using complexity and familiarity to create questions in Mathematics

The QCAA Mathematics standards elaborations use complexity and familiarity to describe the discernible differences between performance levels. Complexity and familiarity are described in the standard elaborations Notes section — Table 2. This resource provides examples of questions with different levels of complexity and familiarity for Year 7.

Aspect of the achievement standard	Related content description/s	Examples of evidence	Mathematical proficiencies
Students classify polygons according to their features and create an algorithm designed to sort and classify shapes.	**Space** • classify triangles, quadrilaterals and other polygons according to their side and angle properties; identify and reason about relationships AC9M7SP02 • design and create algorithms involving a sequence of steps and decisions that will sort and classify sets of shapes according to their attributes, and describe how the algorithms work AC9M7SP04	• classifying polygons according to their features	Understanding
		• creating an algorithm designed to sort and classify shapes	Problem-solving
They represent objects two-dimensionally in different ways, describing the usefulness of these representations.	**Space** • represent objects in 2 dimensions; discuss and reason about the advantages and disadvantages of different representations AC9M7SP01	• representing objects two-dimensionally in different ways	Understanding
They ~~use mathematical modelling to~~ solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation	**Measurement** • use mathematical modelling to solve practical problems involving ratios; formulate problems, interpret and communicate solutions in terms of the situation, justifying choices made about the representation AC9M7M06	• solving practical problems involving rational numbers, percentages and ratios, in applied contexts	Fluency

Complexity annotations	Complex unfamiliar questions (A or equivalent)	Familiarity annotations	Complexity annotations	Complex familiar questions (B or equivalent)	Familiarity annotations	Complexity annotations	Simple familiar questions (C or equivalent)	Familiarity annotations
Students work through a number of elements and make a connection between their understanding of useful representation of three-dimensional objects in two-dimensions and their understanding of ratio for the diagram. Interpretation is required to develop a response.	Alex, Billie and Charli are planning a camping trip. They each have a different shaped tent and need to fit them in a shared camp site that is a 10 metre by 10 metre square. The site owner uses the following algorithm to check that the arrangement of tents on a shared site is safe. 	All the information to solve the problem is not immediately identifiable. The required procedure is not clear from the way the problem is posed. The context is unfamiliar to students as it was not the main focus in the teaching and learning program.	Students make connections between mathematical concepts. They are required to connect their knowledge of classifying polygons according to their features and creating an algorithm designed to sort and classify shapes. Some interpretation is required to develop a response.	Write an algorithm that sorts triangles into the following categories: • equilateral triangles • isosceles triangles • scalene triangles. Test your algorithm with the following triangles: 	All the information to solve the problem is identifiable. The required procedure is clear from the way the problem is posed. The context is familiar to students as it was a focus in the teaching and learning program. Students have had previous experience with this algorithm in class.	Students classify polygons according to their features using a provided algorithm. The question is broken into parts.	The algorithm in the figure below can be used to classify shapes. 	All the information to solve the problem is identifiable. The required procedure is clear from the way the problem is posed. Using a flowchart to classify polygons is familiar to students as it was a focus in the teaching and learning program.

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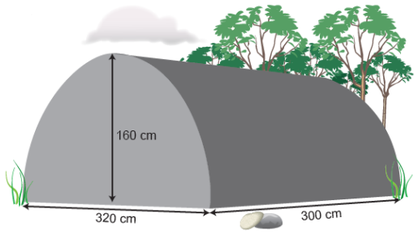
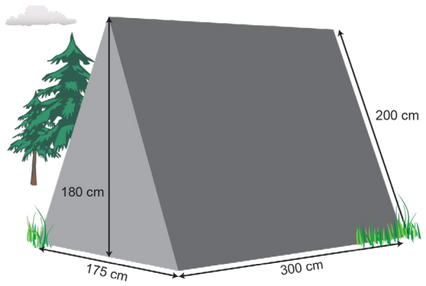
These are the tents:

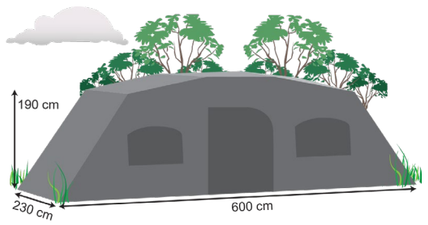
Alex's tent:



Billie's tent:



Charli's tent:

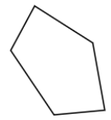


Can Alex, Billie and Charli safely fit all their tents on the site?

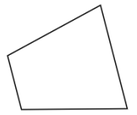
Give clear mathematical reasoning to support your representation.

Use this algorithm to classify the following shapes:

a.



b.



c.