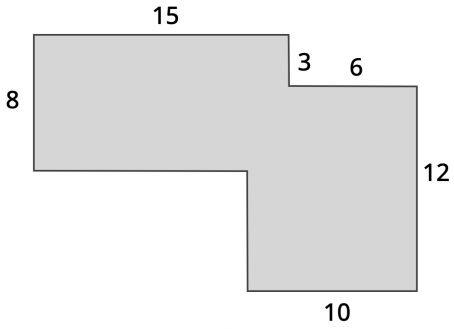
Preparation Task #1

A Maisie and Julian have been asked to find the area of this shape.



Their teacher told them that all angles shown were right angles and that all lengths are given centimetres.

Julian starts by drawing 2 rectangles and places one on top of the other to create the shape.

He wants to find the area of the overlapping region.

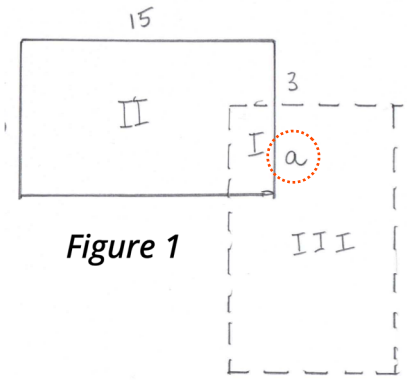


Figure 1

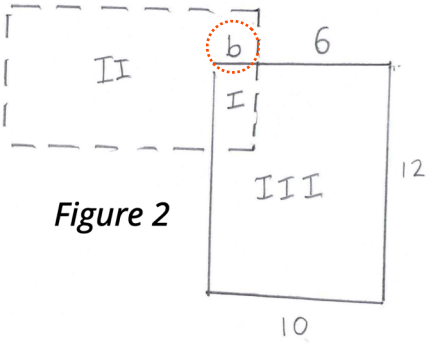


Figure 2

Decide how to calculate the missing length for *Figure 1* (labelled *a*) and width for *Figure 2* (labelled *b*).

Add this information to the figures.

B Maisie uses the information from *Figures 1* and *2* and **declares** the answer to the problem is **240 cm²**.

She is incorrect.

Describe how she arrived at her answer.

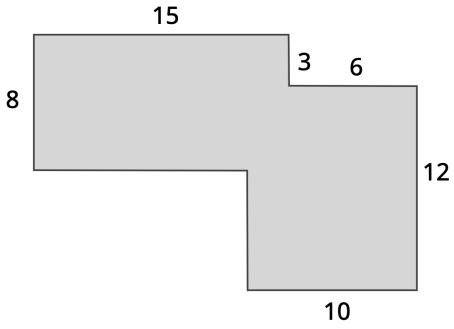
Pinpoint the detail she overlooked in her calculation.

C Eloy and his partner solved this problem correctly.

He says to Maisie and Julian, "We solved this differently. We enclosed the shape within one large rectangle."

Use Eloy's method to work out the shaded area.

Record the steps Eloy followed to find the area.



Preparation Task #2

A Patrick and Malee work together to solve this problem:

A teacher surveyed 24 students and discovered that:

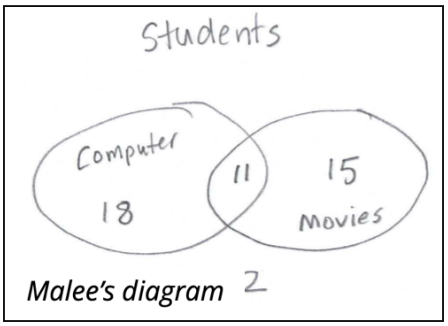
- 18 of them like to play computer games;
- 15 of them like to go to the movies; and
- 2 of them do not like either playing computer games or going to the movies.

How many of the 24 students like both activities?

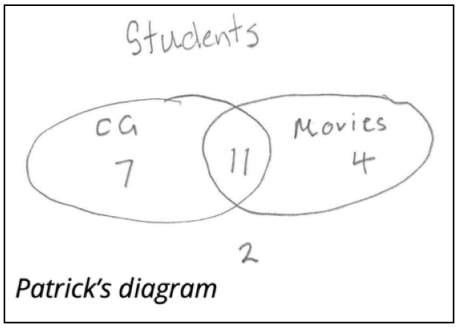
Patrick and Malee both decide to use a Venn diagram to solve this problem.

Analyse each of the diagrams below.

Identify the student whose diagram is incorrect and **discuss** why.



Malee's diagram



Patrick's diagram

B Patrick suggests they use another method to **check** their solution.

He rules up a diagram with 24 boxes, representing the 24 students.

Patrick writes an *N* in 2 of the boxes for the students who don't like either activity. Then, he writes C in 18 boxes to record the students who like playing computer games in the diagram.

Finally, Patrick writes *M* 15 times to represent the 15 students who like going to the movies.

Discuss with your partner how this diagram helps Patrick and Marlee check their solution.

N	N	C	C	C	C	C	C
C	C M	C M	C M	C M	C M	C M	C M
C M	C M	C M	C M	M	M	M	M

C ***Challenge:***

Can you solve this problem by drawing a similar diagram?

Out of all the students at Wantagh Middle School, 80% own computers and 40% are in the band.

However, 10% of all the students neither own computers nor are in the band.

What percentage of students own computers and are in the band?

Preparation Task #3

A Luella and Edison work together to solve this problem:

> Takeru has four 1 cm long blocks, three 5 cm long blocks, and three 25 cm long blocks.
> By joining these blocks to make different total lengths, how many different lengths of at least 1 cm can Takeru make?

Edison immediately says, "I know how to solve this! $4\times3\times3=$**36**."

Edison is incorrect.

Identify the method he is recommending.

Provide an example of a problem where this method works.

Explain why Edison's method does not work in this case.

B Luella suggests they solve the problem by establishing the maximum length they can make with the blocks.

"When we know that," Luella says, "we can eliminate the lengths that are impossible to make."

Determine the largest length that can be made with the blocks.

Find and **show** 3 lengths longer than 30 cm that cannot be made with these blocks.

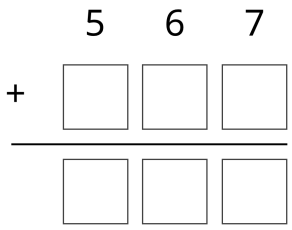
Preparation Task #4 - **Challenge**

A Penny and Brett are solving a problem.

They know every digit from 1 through 9 must appear exactly once in the correct addition problem to the right.

Penny says, "It's impossible to place 9 or 8 directly below the 7.'

Consider if you agree with her and **explain** your decision.



B Brett is confident that **4** must be in the **addend**.

Explore the following possibilities to **determine** if he is correct.