Task Title: Calculate the Area of a Room that Includes a Bay Window

OALCF Cover Sheet – Practitioner Copy

Learner Name: _____

Date Started: _____

Date Completed: _____

Successful Completion: Yes ☐   No ☐

Goal Path: Employment ☐   Apprenticeship ☐

Secondary School ☐   Post Secondary ☐   Independence ☐

Task Description: Learner will calculate the area of a room that includes a bay window.

Main Competency/Task Group/Level Indicator:

- Understand and Use Numbers/Use measures/C3.3

Materials Required:

- Pen/pencil and paper and/or digital device
- Calculator or digital device with calculator function
- Ruler

Notes for Instructors/Practitioners

This is an advanced task requiring the learner to know what a polygon is and how to calculate area using the Pythagorean Theorem.

Learner Information

An important part of the job of a skilled construction tradesperson involves making calculations based on instructions such as blueprints.   Before laying the floor covering, a contractor must calculate the area of the floor to know how much carpet or tile must be ordered. In complex floors, contractors will split the floor into smaller polygons to make the calculations simpler. Look at the "Diagram of the Living Room".

Diagram of a Living Room
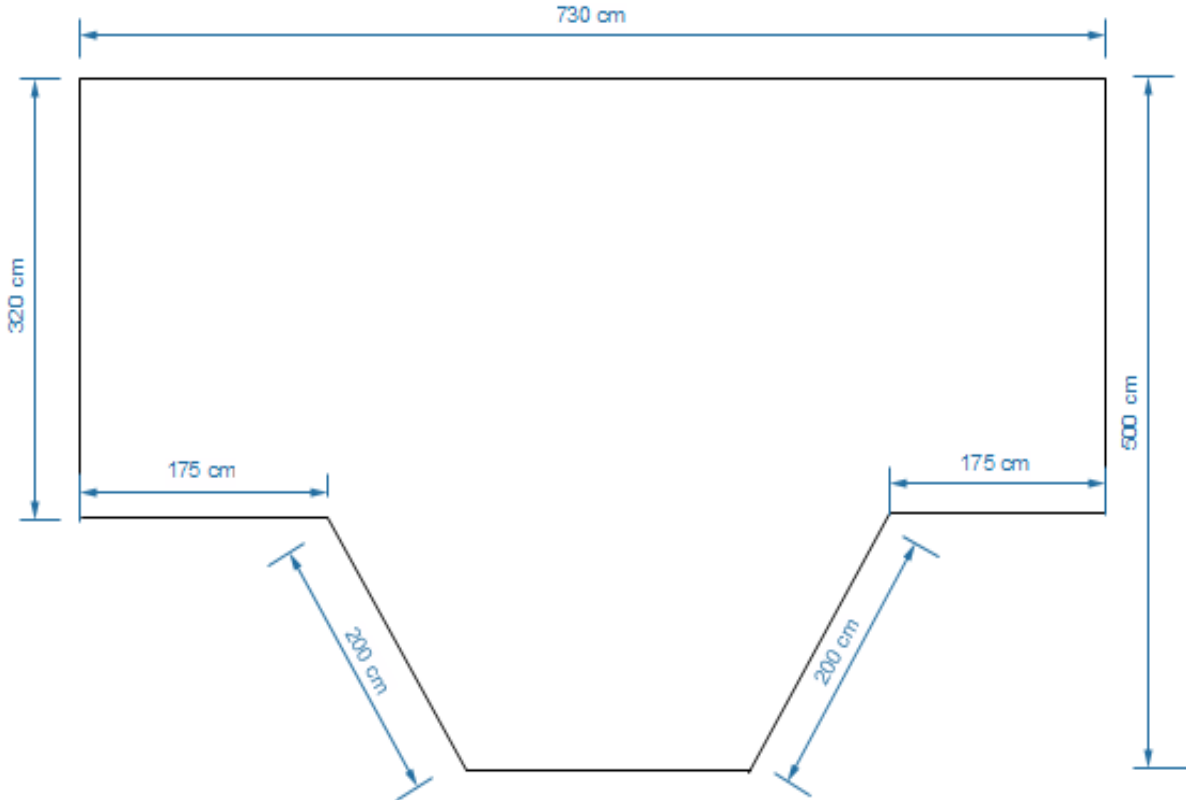
Work Sheet

Task 1: Divide the complex polygon into known polygons. Label these on the room diagram.

Answer: No written response required here.

Task completed: Yes: ☐

_____

Task 2: Calculate the unknown lengths and label them on your diagram. If necessary, round calculations to 2 decimal places.

Answer: No written response required here.

Task completed: Yes: ☐

_____

Task 3: Calculate the area of the living room floor.

Answer:

_____
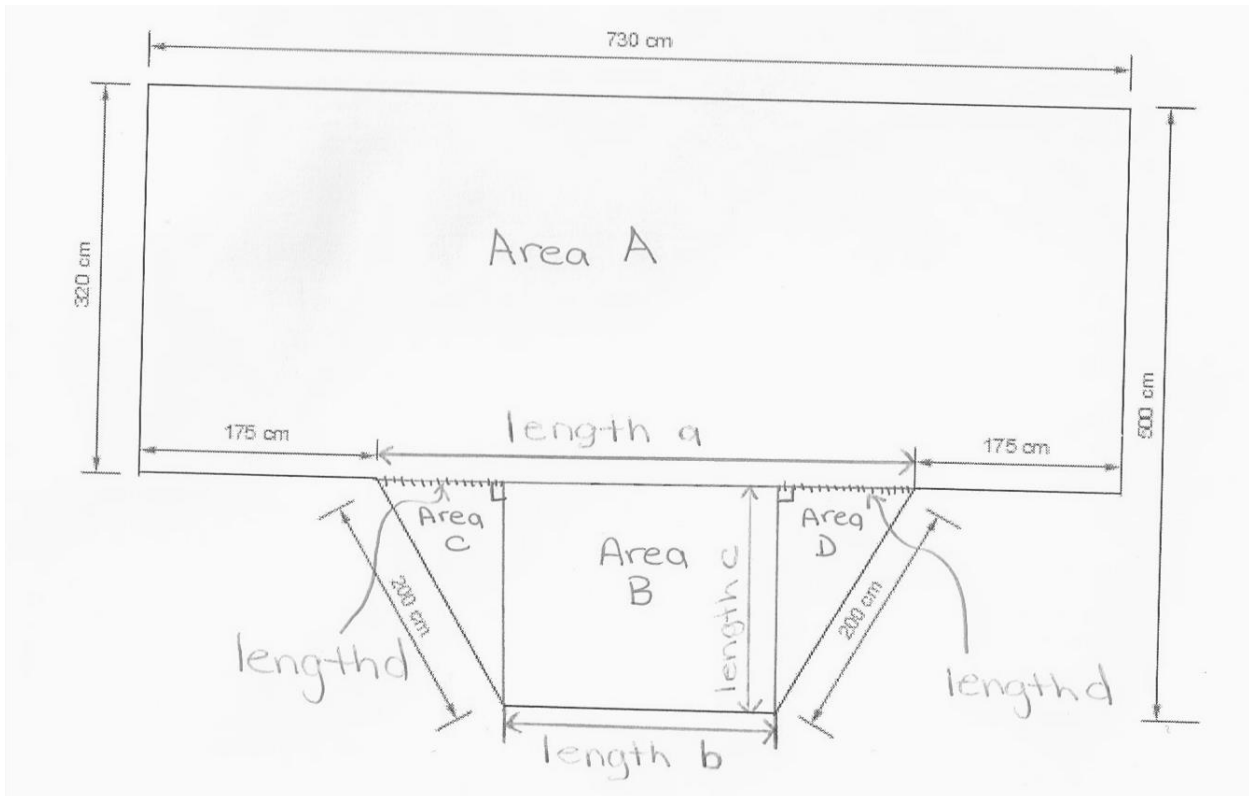
Answers

Task 1: Divide the complex polygon into known polygons. Label these on the room diagram.

Answer: Answers will vary if the learner labelled the diagram differently. One example of a labelled diagram is:

Task 2: Calculate the unknown lengths and label them on your diagram. If necessary, round calculations to 2 decimal places.

The following calculations are for the various lengths labelled on the answer diagram:

length a: 730 – (175+175) = 780-350 = 380 cm

length c: 500 - 320 = 180 cm

length d: needs to be calculated with the Pythagorean Theorem. Round to 2 decimal places.

Let c = 200cm $c^2 = a^2 + d^2$
Let a = 180 cm $(200)^2 = (180)^2 + d^2$
Let d = unknown side d $40\ 000 = 32400 + d^2$
                                $7600 = d^2$
                                $d = \sqrt{7600} = 87.18$ cm

length b: (requires the calculation of length d first)

length b: 730 − (175 + 175 + 87.18 + 87.18 (length d)) =
730 − 524.36 = 205.64 cm

Task 3: Calculate the area of the living room floor.

Answer: The following calculations are for the various areas labelled on the diagram:

Area A = length x width = 730 cm x 320 cm = 233 600 cm²
Area B = length x width = 205.64 cm x 180 cm = 37 015.2 cm²
Area C = ½ (base x height) = ½ (87.18 cm x 180 cm) = 7 846.2 cm²
Area D = ½ (base x height) = ½ (87.18 cm x 180 cm) = 7 846.2 cm²

Note: Area C and D are the same. Student could do the calculation once and multiply it by 2 or calculate the area as a rectangle for C and D. All are acceptable methods of finding the area for these figures.

Area of Floor: Area A + Area B + Area C + Area D = 233 600 cm² + 37 015.2 cm² + 7 846.2 cm² + 7 846.2 cm²

Area of Floor: 286 307.6 cm²

Task Title: CalculateAreaOfRoom_EAI_C3.3

Performance Descriptors

Levels	Performance Descriptors	Needs Work	Completes task with support from practitioner	Completes task independently
C3.3	calculates using numbers expressed as whole numbers, fractions, decimals, percentages and integers			
	understands and uses properties of angles and triangles to solve problems			
	understands and uses formulas for finding the perimeter, area and volume of non-rectangular, composite shapes			
	manages unfamiliar elements (e.g. context, content) to complete tasks			
	chooses and performs required operations; makes inferences to identify required operations			
	interprets, represents and converts measures using whole numbers, decimals, percentages, ratios and fractions			

This task: Was successfully completed ☐ Needs to be tried again ☐

Learner Comments:

Instructor (print):   Learner (print):

_____   _____