# Model Answers

| | | | | |
|---|---|---|---|---|
| **Domain** | Furniture > Furniture Making | | | |
| **Unit** | 16231 v 4 | **Calculate lengths, areas, and costs and percentages of waste for furniture making** | Level 2 | Credits 3 |

## Assessment Information

### Entry Information

There are no pre-requisite requirements for this unit.

### Required Evidence

This Assessment Guide, that includes the following completed assessment tasks:

» One Task Sheet

### Appeals

The candidate must understand the appeals process before carrying out this assessment.

Information about Competenz's assessment appeals process can be found on the Assessors and Moderators page of Competenz's website www.competenz.org.nz.

## Change control

The following changes have been made to 16231 v 4 assessment materials.

| Edition of this document | Changes made |
|---|---|
| Edition 2<br>July 2017 | Version 4<br>Updated to Competenz 2017 assessment templates, including the addition of a 'Candidate evidence check', legislative updates in 'Assessment requirements', and the addition of an 'Assessor final judgement' section.<br>Updated formatting.<br>Footer has been updated to reflect new Edition. |
| Edition 1<br>June 2011 | No changes. Original FITEC document. Version 3 |

## Assessment Requirements

This Assessment Guide is designed to help you provide evidence of your skills and knowledge required by this unit standard.

People credited with this unit standard are able to calculate lengths, areas, and costs and percentages of waste for furniture making.

### Before you begin

Read through the assessment requirements yourself. Talk with your Assessor if there is anything you don't understand.

Meet with your Assessor to plan your assessment. Your Assessor will:

- talk you through this Guide, and discuss when and how you will be assessed.
- check you are ready to begin this assessment.

### What you need to do

1. Complete the following assessment tasks:

| | |
|---|---|
| Task Sheet | Complete **one** Task Sheet. This will involve:<br>Answering 16 questions about calculating lengths, areas and costs and percentages of waste for furniture making. |

2. You may wish to provide additional supporting evidence that proves you have the knowledge and skills required by this unit. Additional evidence may include, for example, workplace documentation you have used and/or completed, training records, photos, screenshots, printouts, videos, voice recordings.
3. When you have completed all assessment tasks, complete the 'Candidate evidence check' at the end of this Guide.
4. When you are sure you have completed and/or attached everything, contact your Assessor or Account Manager to arrange next steps.

### Conditions

- Your evidence must clearly show your ability to calculate lengths, areas, and costs and percentages of waste for furniture making.
- Complete all assessment tasks yourself. Use your own words when answering questions.
- It is expected that you will have had learning / experience of calculating lengths, areas, and costs and percentages of waste for furniture making on more than one occasion, before you are formally assessed.
- It is likely that you will have already been observed of calculating lengths, areas, and costs and percentages of waste for furniture making on more than one occasion, before you are formally assessed.
- All tasks you carry out for this assessment must be completed following workplace procedures, and comply with organisational and legislative (legal) requirements.
- All calculations in this unit standard must be recorded on paper by hand.
- You must show competence calculating with addition, subtraction, multiplication, division.

**Outcome 1:** Unit Standard Evidence Map

| Unit 16231 v 4 | Calculate lengths, areas, and costs and percentages of waste for furniture making | Level 2 | Credits 3 |
|---|---|---|---|
| **Outcomes and Evidence Requirements** | | **Evidence** | **No.** |
| **Outcome 1:** Calculate lengths for furniture making. | | | |
| 1.1 | Required length of timber for a job is calculated from a cutting list.<br>Range cutting list must include – at least four different length components. | Task Sheet | 1 |
| 1.2 | Diameter of a circular component is measured and used to calculate the required length of edging tape to edge the component.<br>Range workings must include – identification of middle of circle, calculation of radius, calculation of circumference. | Task Sheet | 5 |
| 1.3 | The total length of edging tape required to edge a rectangular panel is calculated. | Task Sheet | 6 |
| **Outcome 2:** Calculate areas for furniture making. | | | |
| 2.1 | Components to be cut from panels are measured and their surface areas calculated.<br>Range must include at least one of – circular component, rectangular component, triangular component, square component. | Task Sheet | 7, 8, 9, 10 |
| 2.2 | Total number of panels required for a job is calculated from a supplied cutting list and cutting plan. | Task Sheet | 11 |
| 2.3 | The total surface area of a selected cabinet requiring spray coating is calculated. | Task Sheet | 15 |
| 2.4 | A selected pack of timber is measured and its cubic volume calculated. | Task Sheet | T 16 |
| **Outcome 3:** Calculate costs and percentages of waste for furniture making. | | | |
| 3.1 | Cost of the required length of timber in evidence requirement 1.1 is calculated.<br>Range must include – obtaining cost of timber per metre, percentage allowance for waste. | Task Sheet | 2 & 3<br>12 |
| 3.2 | Percentage of waste for the panels to be cut in evidence requirement 2.1 is calculated. | Task Sheet | 13 |
| 3.3 | **Outcome 2:** Percentage of waste calculated is converted to dollar value.<br>Range must include – obtaining cost of panels. | Task Sheet | 14 |

Any queries, contact: Competenz, PO Box 9005, Newmarket, Auckland 1149. Ph. 0800 526 1800

# Task Sheet

Carefully read through this Task Sheet so you know exactly what is expected.

Complete all tasks in this Task Sheet. You will need to:

- Answer 16 questions about calculating lengths, areas, and costs and percentages of waste for furniture making

You can answer the questions in writing, or give your answers verbally to your Assessor who will write down what you say. You may need to arrange this in advance with your Assessor.

Your Assessor may ask you additional questions to check your knowledge and understanding.

### Assessor

This Task Sheet supports Outcomes 1, 2 and 3.

### Judgement statements

- ☐ The completed Task Sheet supports the candidate's successful performance in calculating lengths, areas, and costs and percentages of waste for furniture making
- ☐ The candidate's written and/or verbal responses support their competency in the tasks.
- ☐ The candidate has demonstrated competence in addition, subtraction, multiplication and division.

| | | | |
|---|---|---|---|
| **Your name** | Candidate name provided | | |
| **Workplace** | Workplace identified | | |
| **Date begun** | Date recorded | **Date completed** | Date recorded |
| **Answers written by** (Tick one) | ☐ Candidate ☐ Assessor ☐ Other (please write): | | |
| **Terms** | C = Circumference<br>A = Area<br>r = radius<br>$\pi$ = pi = 3.142<br>B = Base<br>H = Height<br>d = diameter | | |
| **Formulae** | You may find the following formulae useful.<br>Circle: C = $\pi$d<br>A = $\pi r^2$<br>Triangle: A = ½ B x H<br>Rectangle: C = 2B + 2H<br>A = B x H | | |

**To be competent all of your workings and answers must be correct according to the Model Answer Guide for each question.** ☑

1. Calculate the total required length for each of the different sized timber from the cutting list below (answer to be in metres). ☑

| **Cutting List - Outdoor table** | | | |
|---|---|---|---|
| | **Quantity** | **Size** | **Length** |
| Top slats | 5 | 100mm x 50mm | 1500mm |
| Cleats | 2 | 100mm x 50mm | 660 mm |
| Legs | 4 | 100mm x 50mm | 1000mm |
| Braces | 2 | 100mm x 50mm | 740mm |

| **Item** | **Workings and answer** |
|---|---|
| Top slats | 5 x 1500 = 7500mm |

| | |
|---|---|
| Cleats | 2 x 660 = 1320mm |
| Legs | 4 x 1000 = 4000mm |
| Braces | 2 x 740 = 1480mm |
| Total length | 7500 + 1320 + 4000 + 1480 = 14300mm or 14.3m |

**Assessor**

This question supports E.R. 1.1.

**Judgement statement**

☐ The candidate completes the table correctly

Example answer

As above

2. The total cost of the timber was $42.90. Calculate the cost per metre to two decimal places. ☑

**Assessor**

This question supports E.R. 3.1.

**Judgement statements**

☐ The candidate provides the correct working and answer.

**Example Answer**

$42.90 ÷ 14.3 = $3.00

3. Calculate the new required total length of timber to allow for 12% wastage (answer to be in metres to 3 decimal places). ☑

**Assessor**

This question supports E.R. 3.1.

**Judgement statements**

☐ The candidate provides the correct working and answer.

**Example Answer**

14300 x 0.12 = 1716

14300 ÷ 1716 = 16016 or 16.016m

4. Calculate the total cost of timber for the overall job to two decimal places. ☑

**Assessor**

This question supports E.R. 3.1.

**Judgement Statements**

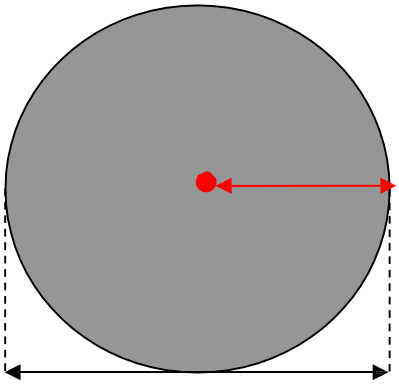
☐ The candidate provides the correct working and answer.

**Example Answer**

16016mm x $3.00 = $48.05

5. Mark the radius on this circle and then calculate the circumference of the table top to determine the amount of edging tape required. Give your answer in metres. ☑

**Table Top**




**Assessor**

This question supports E.R. 1.2

**Judgement Statements**

☐ The candidate correctly identifies the middle of the circle

☐ The candidate correctly calculates the radius

☐ The candidate correctly calculates the circumference.

**Example answer**

Radius = 600 ÷ 2 = 300

C = $\pi$d

C = 3.142 x 600 = 1885.2m = round to 2 dp = 1.89

Table top requires 1.89m of edging tape.

6. Calculate the amount of edging tape required to go around this rectangular table top (answers to be in metres). ☑


**Assessor**

This question supports E.R. 1.3

**Judgement Statements**

The candidate correctly identifies the middle of the circle

The candidate correctly calculates the radius

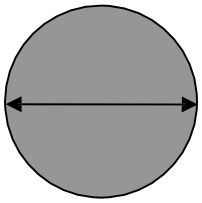
The candidate correctly calculates the circumference.

**Example answer**

1850 + 1850 + 900 + 900 = 5500

Answer 5500mm or 5.5m of edging tape required.

7. Calculate the surface area of the following component: ☑




**Assessor**

This question supports E.R. 2.1

**Judgement Statements**

☐ The candidate correctly measures the circle and calculates the surface area.

☐ Example Answer

A = $\pi r^2$ = 3.142 x $0.45^2$

A = 3.142 x (0.45 x 0.45)

= 3.142 x 0.2025

= 0.636$m^2$

8. Calculate the surface area of the following component: ☑


**Assessor**

This question supports E.R. 2.1

**Judgement Statements**

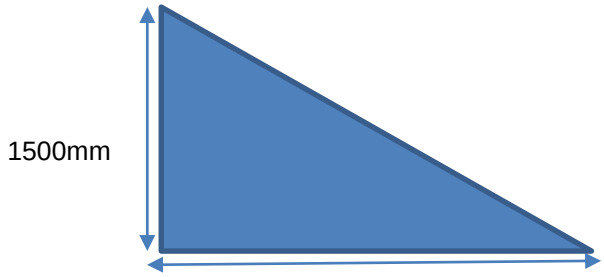
The candidate correctly measures the rectangle and calculates the surface area.

**Example answer**

A = B x H

A = 2.5 x 1.4 = 3.5m$^2$

9. Calculate the surface area of the following component: ☑




**Assessor**

This question supports E.R. 2.1

**Judgement Statements**

☐ The candidate correctly measures the triangle and calculates the surface area.

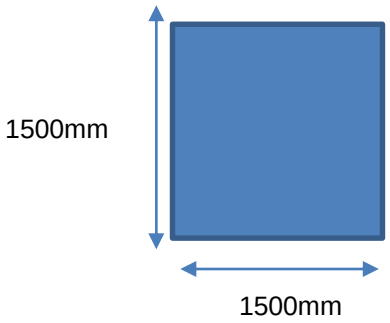
**Example answer**

A = ½ B x H

A = (0.5 x 1.6) x 1.5

A = 1.2m$^2$

10. Calculate the surface area of the following component: ☑




**Assessor**

This question supports E.R. 2.1

**Judgement Statements**

☐ The candidate correctly measures the square and calculates the surface area.

**Example answer**

A = H x W

A = 1.5 x 1.5 = 2.25m$^2$

11. Using the information provided calculate how many 2440mm x 1220mm sheets are required for the supplied cutting list / plan. ☑

| Cutting List / Plan |
|---|
| 15 pieces 550 x 550mm |

**Assessor**

This question supports E.R. 2.2

**Judgement Statements**

☐ The candidate correctly calculates the total number of sheets required for the cutting list / plan.

**Example answer**

(550 x 550) x 15 = (0.55m x 0.55m) x 15 = 4.5375m$^2$

2440 x 1220 = 2.44 x 1.22 = 2.9768m$^2$

Total sheets required = 2

12. The total cost for cutting list material in question 11 is $160.00. Calculate the cost per sheet. ☑

**Assessor**

This question supports Outcome 3

**Judgement Statements**

☐ The candidate correctly calculates the cost of one sheet.

**Example answer**

$160 ÷ 2 = $80

13. From the cutting list in questions 11 calculate the total percentage of waste to two decimal places. ☑

**Assessor**

This question supports E.R. 3.1

**Judgement Statements**

☐ The candidate correctly calculates the percentage of waste for the sheets to be cut in question 11.

**Example answer**

(2440 x 1220) x 2 = (2.44 x 1.22) x 2 = 5.9536m$^2$

5953.6 – 4537.5 = 1416.1mm or 1.416m$^2$

1416.1 x 100

5953.6

Total % = 23.78%

14. Convert the percentage of waste in question 13 to a dollar value to two decimal places. ☑

**Assessor**

This questions supports E.R. 3.3

**Judgement Statements**

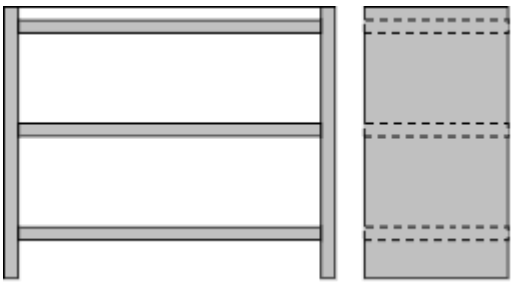
☐ The candidate supplies the correct working and answer.

**Example answer**

0.2378 x $160 = $38.05

15. The bookshelf below is to be sprayed. Calculate the total surface area to be covered in square metres to two decimal places. (Answers to be in $m^2$ so change millimetres to metres in your calculations). ☑

Note only one side of the back of the bookshelf requires spraying. None of the edges are to be sprayed.



| Cutting List / Plan |
|---|
| 5 pieces 780 x 190 x 19mm |
| 1 backing sheet 810 x 690 x 4mm pine ply |

**Assessor**

This question supports E.R. 2.3

**Judgement Statements**

☐ The candidate correctly calculates the total surface area of a cabinet requiring spraying.

**Example answer**

*Area of pieces:*

0.190 x 0.780 = 0.1482mm$^2$

0.1482 x 5 = 0.741m$^2$

0.741 x 2 = 14820 (both sides)

= 1.482m$^2$

*Area of backing sheet:*

810 x 690 mm =

0.81 x 0.69m = 0.5589m$^2$

*Total surface area:*

1.482 + 0.5589 = 2.0409 m$^2$

= 2.04m$^2$

16. Calculate the volume of a pack of timber with the following dimensions. ☑

Width = 6 pieces of timber at 100mm wide

Height = 1700 mm

Length = 5400mm (Answer to be in $m^3$)

**Assessor**

This question supports E.R. 2.4

**Judgement Statements**

☐ The candidate correctly measures a pack of timber and calculates the cubic volume correctly.

**Example answer**

6 x 100 = 600mm

600mm x 1700mm x 5400mm = 0,6 x 1.7 x 5.4$m^3$

0.6 x 1.7 = 1.2 or 0.6 x (1.7 x 5.4) = 0.6 x 9.18

1.02 x 5.4 = 5.508$m^3$ or 0.6 x 9.18 = 5.508$m^3$

**You have reached the end of the Task Sheet.**

## Candidate evidence check

| Required evidence |
| --- |
| Use this checklist to make sure you finished the assessment tasks in full.<br>Clearly name and label all attachments.<br>**I have completed and/or attached:**<br>☑ One completed Task Sheet<br><br>**Assessor**<br>The required evidence for each assessment has been completed and/or attached. |
| **Additional supporting evidence** |
| If you have any other evidence which helps prove your skills and knowledge in this unit (such as completed documents, photos, videos or voice recordings), attach it and record it below.<br>Clearly name and label all attachments.<br>I have attached the following as additional supporting evidence:<br><br>**Assessor**<br>There is no requirement to attach additional supporting evidence.<br>Any additional supporting evidence is relevant and further supports the candidate's competency in this unit. |

## Assessor final judgement

After reviewing the candidate's evidence for Unit Standard 16231 v 4, it is clear that the candidate can competently:

- ☑ Calculate lengths for furniture making.
- ☑ Calculate areas for furniture making.
- ☑ Calculate costs and percentages of waste for furniture making.

| **Assessor feedback to the candidate** | | | |
|---|---|---|---|
| Please provide specific feedback to the candidate about their performance in meeting the requirements of this unit standard. | | | |
| **Assessor** | Assessor name recorded | **Date** | Date recorded |