Trainer Value Pack

LEARNER GUIDE

Includes review questions

Training support material for:

RIICCM201E

Carry out measurements and calculations

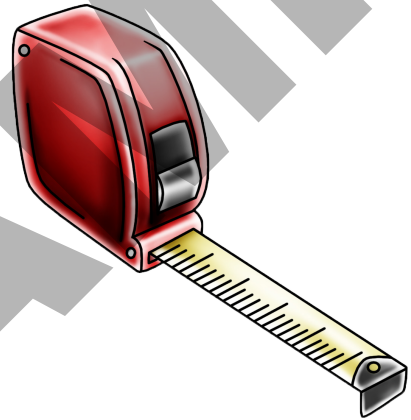
TRAINER'S GUIDE

Produced by:

EASY GUIDES
Australia Pty Ltd

CONTENTS

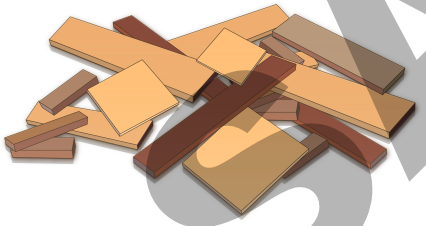
INTRODUCTION TO MEASUREMENTS AND CALCULATIONS



Measurements and calculations

Measurements and calculations are used in the resources and infrastructure industries for many different tasks. Measurements and calculations must be accurate and clearly recorded. It includes using measurements and calculations to estimate quantities for various work activities.

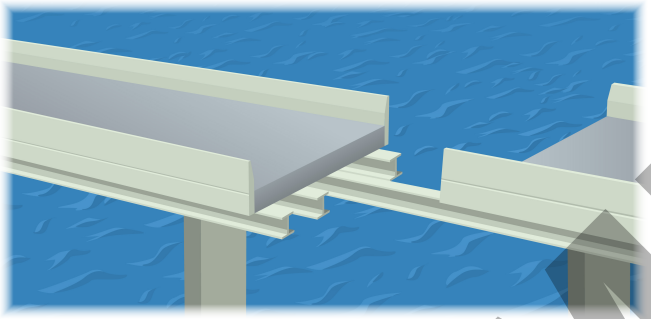
Accurate measurements and calculations will make sure that:

Correct quantities of materials are ordered 	Materials are cut to correct sizes 	The work is done in line with plans and specifications 
Waste is kept to a minimum. Think of the environment. 	Quotes are accurate 	Work is carried out safely 

Measurements and calculations (continued)

If measurements and calculations are not correct, accurate and clearly recorded it may cause:

Poor workmanship



Wasted time or delays in completing the job

Wasted money

Safety issues

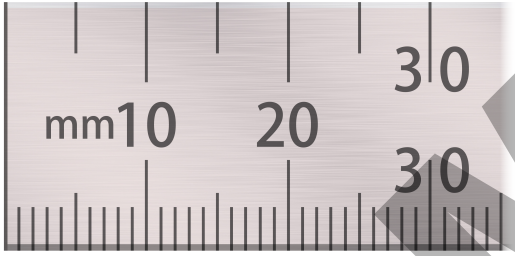
Units of measure

Measurement is finding a number that shows the amount or size of something. Measurements can be taken and recorded as either metric or imperial. The metric system is the internationally agreed system of measure. While some countries still use the imperial system. The Australian building trades adopted the metric system in 1966.

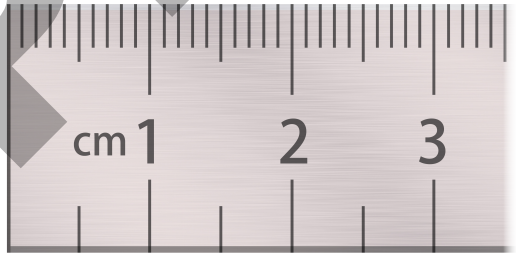
This learner's guide will always refer to the metric system.

The length, width, height and depth of objects or spaces can be measured in:

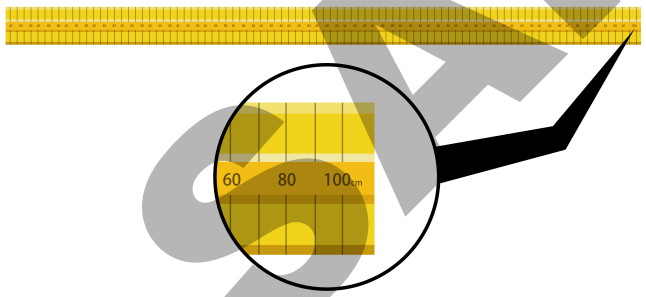
Millimetres (mm)



Centimetres (cm)



Metres (m)



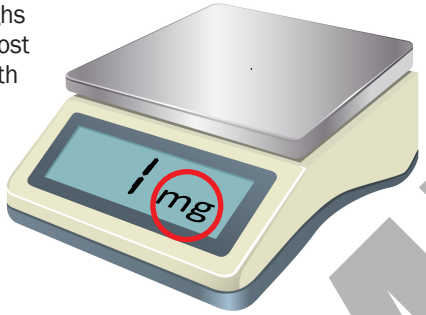
Kilometres (km)

Units of measure (continued)

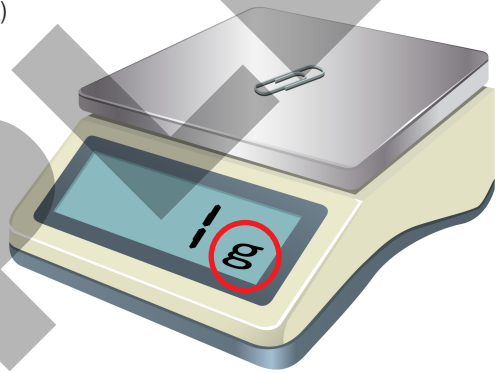
The weight or mass of an object can be measured in:

Milligrams (mg)

Something that weighs one milligram is almost impossible to see with the naked eye.

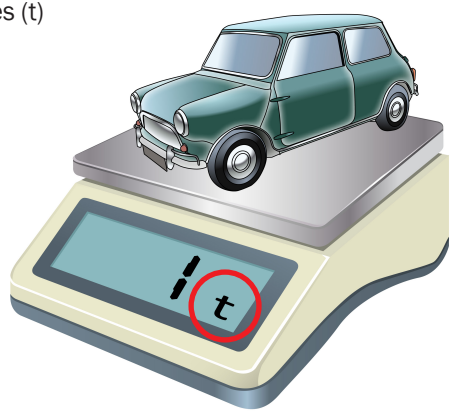


Grams (g)



Kilograms (kg)

Metric tonnes (t)

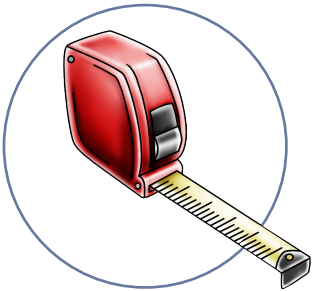


Units of measure (continued)

These tables show how metric and imperial weights and measurements compare with each other.

Metric →	Imperial
1 millimetre	0.03937 inches
1 centimetre	0.3937 inches
1 metre	1.0936 yards
1 kilometre	0.6214 miles
2.54 cm	1 inch
30.48 cm	1 foot
91.44 cm	1 yard
1.6093 km	1 mile

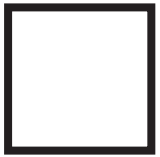
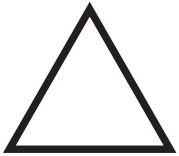
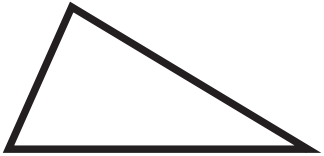
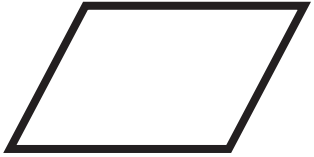
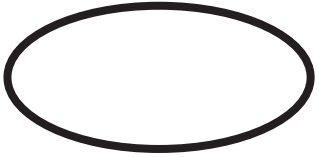
Imperial →	Metric
0.0353 ounces	1 gram
2.2046 pounds	1 kilogram
1.1023 short tonne	1 metric tonne
1 ounce	28.350 grams
1 pound	453.59 grams
1 short tonne	0.9072 metric tonnes



Basic shapes

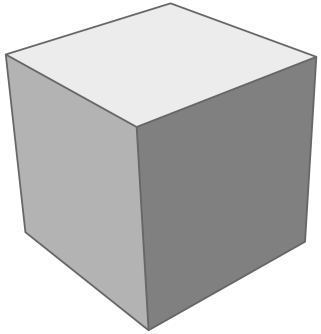
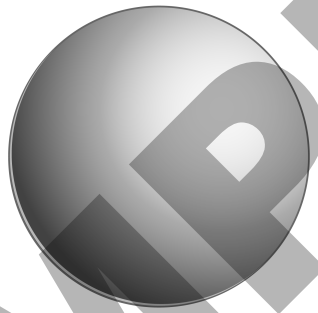
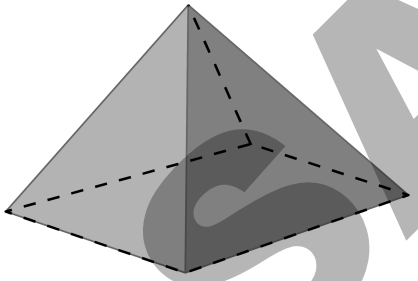
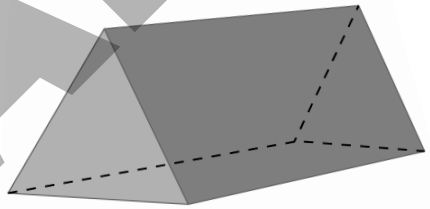
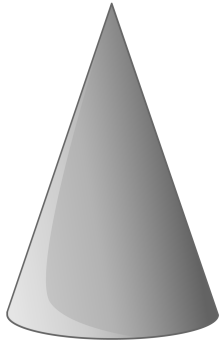
Shapes can be described as either **two dimensional (2D)** or **three dimensional (3D)**.

Two dimensional (2D)

Square 	Circle 	Rectangle 
Equilateral triangle  3 equal sides and 3 equal angles – always 60°	Isosceles triangle  2 equal sides and 2 equal angles	Scalene triangle  No equal sides and no equal angles
Trapezoid 	Parallelogram 	Ellipse 

Basic shapes (continued)

Three dimensional (3D)

Cube 	Sphere 	Cylinder 
Square pyramid 	Triangular prism 	Cone 

Basic mathematics symbols

Addition (plus) + For example, 6 + 2 = 8	Subtraction (minus) − For example, 6 − 2 = 4	Multiply (times) × or * For example, 6 × 2 = 12	Divide (how many) ÷ or / For example, 6 ÷ 2 = 3
Equals (total) = For example, 6 = 3 + 3	Brackets ( ) For example, 6 + (3 × 2)	Greater than > For example, 5 > 4	Less than < For example, 4 < 5
Powers 2^2 2^3 For example, $2^2 = 2 \times 2 = 4$ $2^3 = 2 \times 2 \times 2 = 8$	Square root √ For example, √25 = 5	Fraction 1/4 For example, 1 out of 4	Decimal 0·5 For example, ½ is the same as 0·5
Percentage % For example, 50% = 50 out of 100	Not equal to ≠ For example, 5 × 2 ≠ 30	Degrees ° 15 For example, 90° angle	Pi π For example, = 3.14159

PLAN AND PREPARE FOR MEASUREMENTS AND CALCULATIONS

Element 1

Select and check tools and equipment (continued)

Keep measuring equipment stored away from direct sunlight, high temperatures and excessive moisture.

Any tool or piece of equipment which is faulty or damaged should not be used.

It should be:

- Separated from good equipment
- Tagged '**Do not use**'
- Reported to the supervisor
- Repaired or replaced.

Calibration

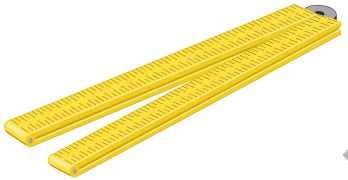
This is when tools or equipment are tested against a standard to make sure they are still accurate.

If they are no longer accurate they can be adjusted, or may need to be replaced. Some tools and equipment need to be calibrated at regular intervals.

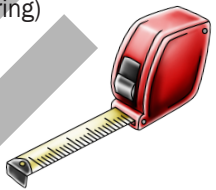
QUESTION 5

List four (4) pieces of equipment that can be used for measuring or calculating.

Ruler

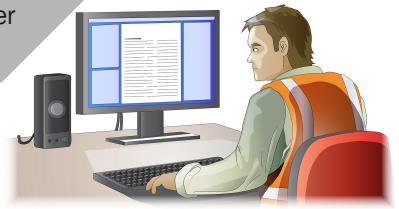


Measuring tape (measuring)



Calculator

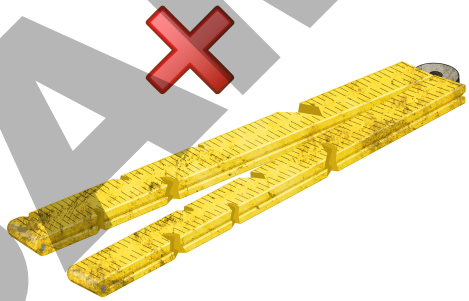
Computer

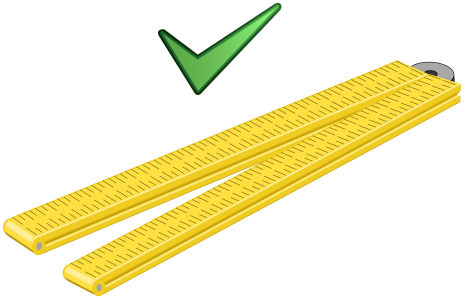


QUESTION 6

Why is it important to make sure tools and equipment are in good condition before starting work?

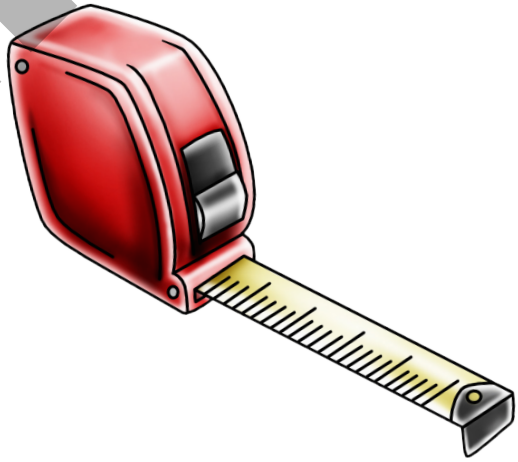
To make sure work is carried out safely, accurately and efficiently.





PERFORM MEASUREMENTS

Element 2



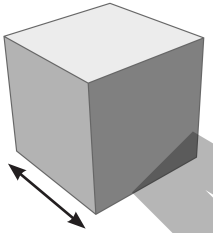
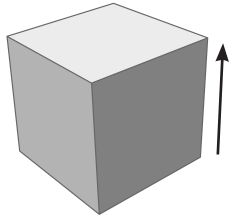
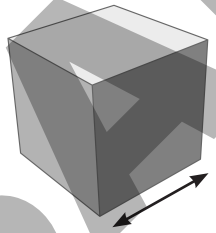
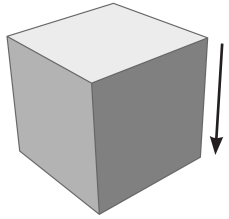
Measurement methods

When you need to measure something it is important to choose the correct way of doing it so results are accurate.

There are many different ways to measure things and different formulas that can be applied depending on the information you need and the object you have to measure.

Length, height, width and depth

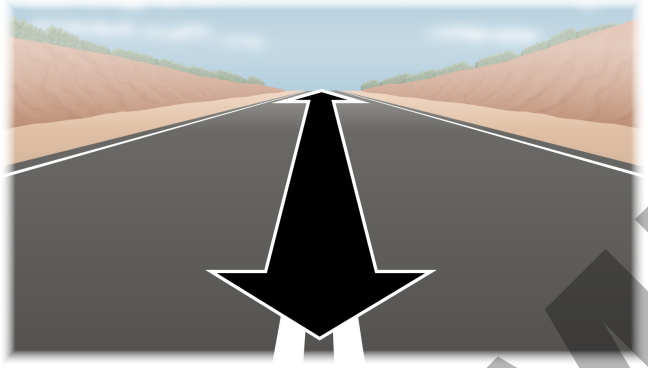
Length, height, width and depth measurements are performed by measuring in a straight line from one point to another, this will give you the distance between the two points.

Length 	Height 
Width 	Depth 

View examples on the next page

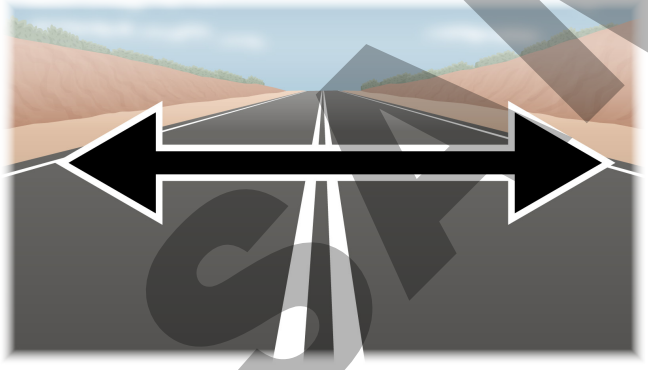
Length, height, width and depth (continued)

How long is the road?

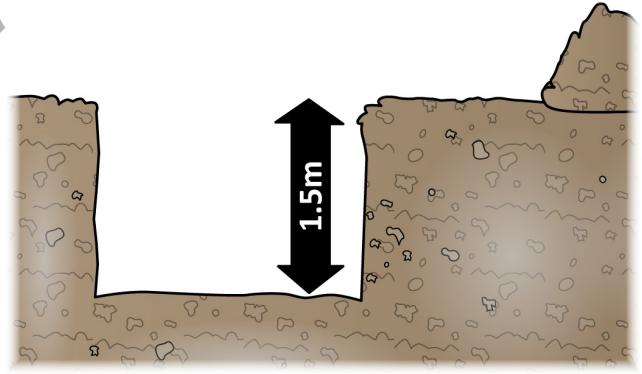


How high is the bridge?

How wide is the road?



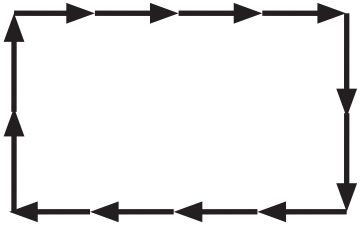
How deep is the excavation?

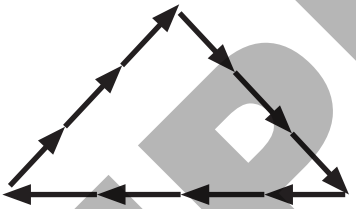


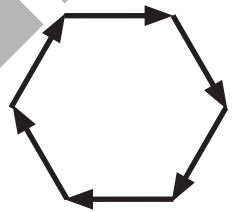
Measurement methods – examples (continued)

Perimeter

Perimeter is the measurement of distance around the outside of a two dimensional shape.







For example:

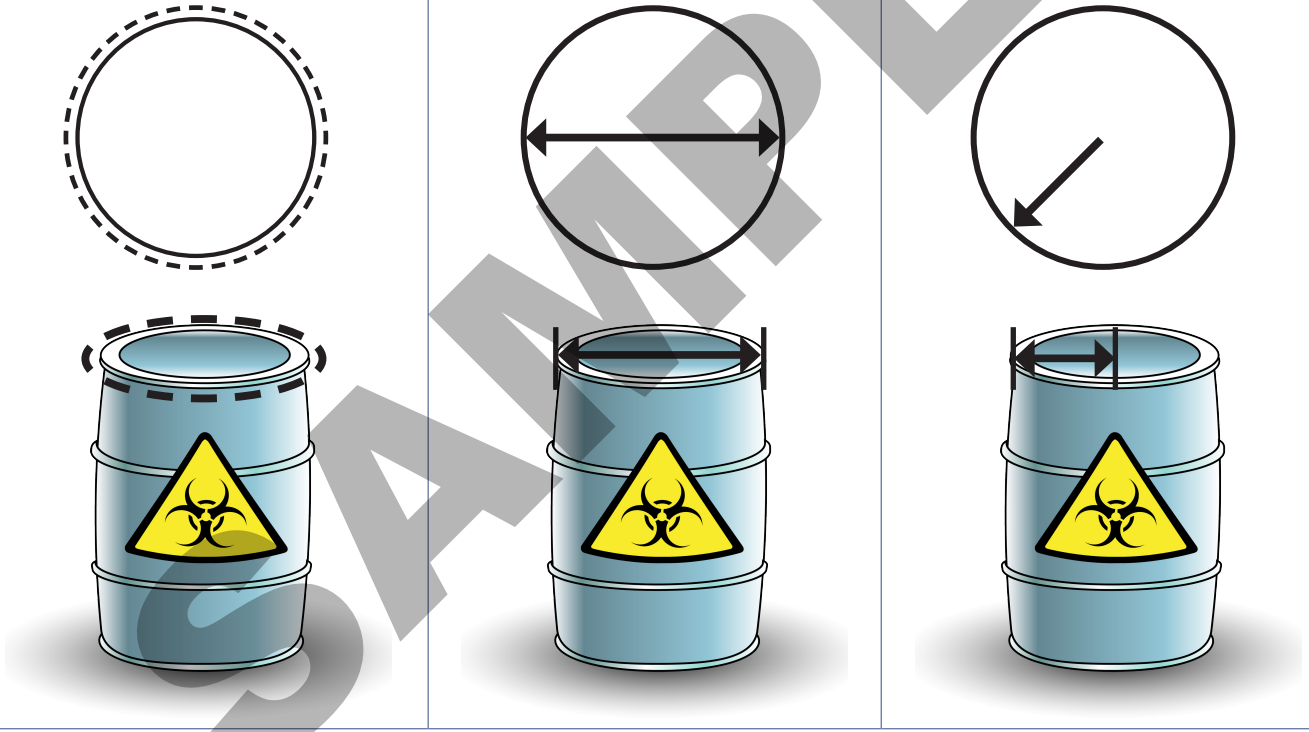
If you wanted to work out how much fencing was required to go around a job site, you would measure the distance on the outside of the site (around the perimeter).

Measurement methods (continued)

Circumference, diameter and radius

Circumference, diameter and radius are measurements that can be taken on a closed circular or curved object.

Circumference
– around the outside



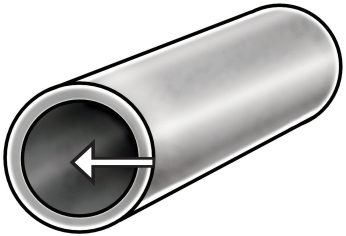
Diameter
– from one side to the other side

Radius
– from the edge to the centre

Circumference, diameter and radius (continued)

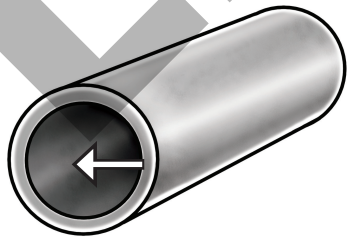
If you are measuring the diameter or radius of a pipe you need to know if it is the inside or outside radius or diameter that needs to be measured.

Outside radius



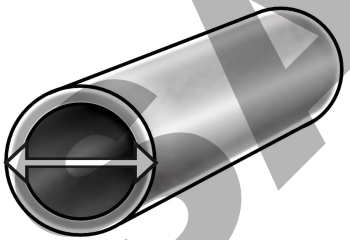
If you need to know how much space a pipe would take up you need the outside radius/diameter to calculate the volume.

Inside radius

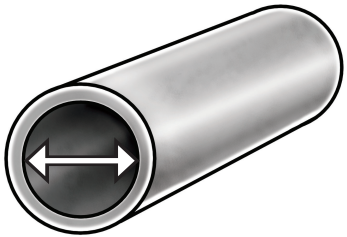


If you need to know how much water a pipe could hold you would need to know the inside radius/diameter to calculate the volume.

Outside diameter (O/D)



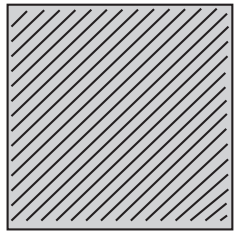
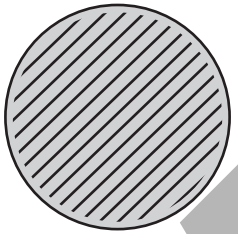
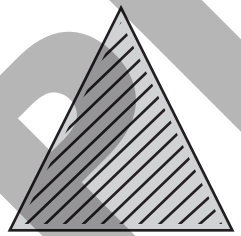
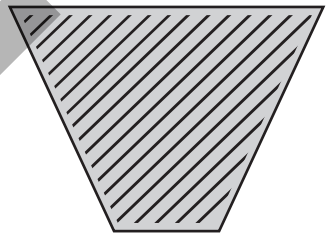
Inside diameter (I/D)



Measurement methods (continued)

Area

Area is the size of a surface. Area can also be called surface area. The standard unit of measure for area is metres squared (m^2). A square metre is the same as a square on which all sides equal 1 metre.

For example:

You would calculate the area of a wall to work out how much paint is needed to cover the wall.

This is because you only need to know how much area the paint needs to cover, the thickness of the paint is not important.

QUESTION 11

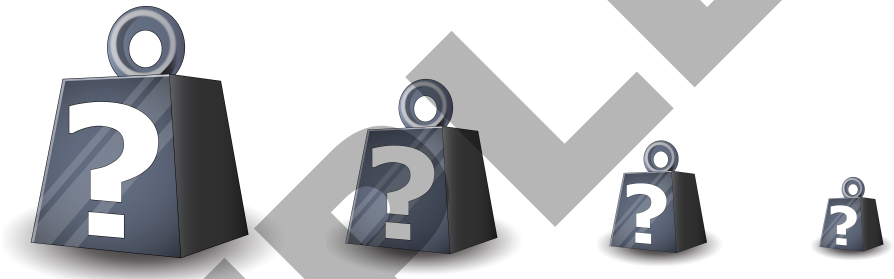
Weight is the amount or quantity of heaviness of an object or material.

What are the four (4) units of measure used to describe weight?

Write the answers in the boxes.

The units of measurement are:

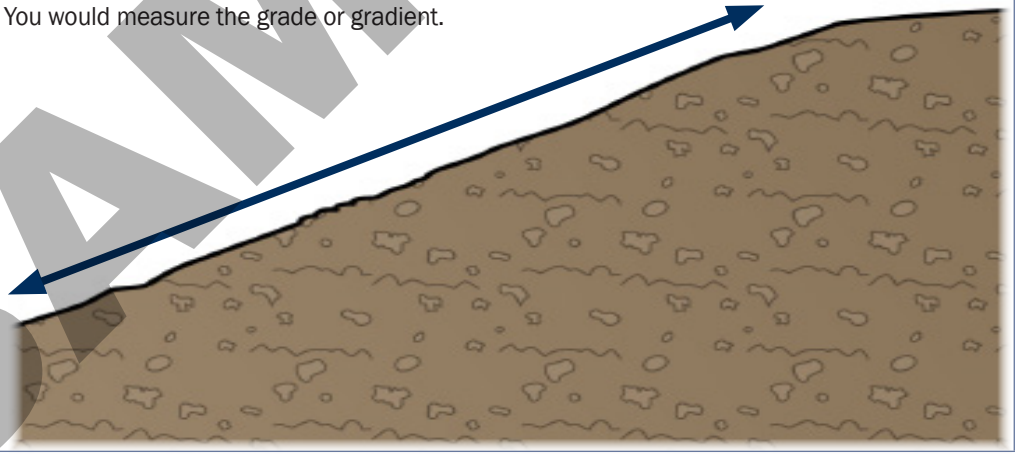
Tonnes=T	kilograms=kg	grams=g	milligram=mg



QUESTION 12

What would you measure if you wanted to find the amount of slope on a hill?

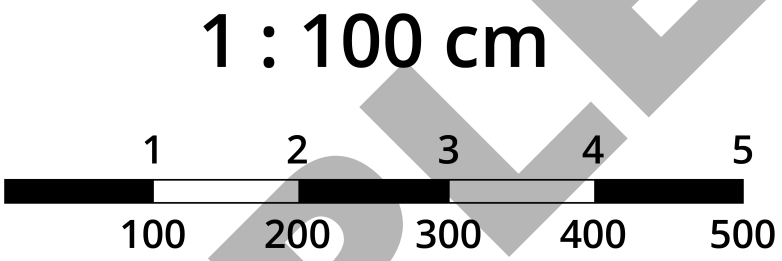
You would measure the grade or gradient.



QUESTION 13

Why do maps or plans have a scale?

Maps or plans have a scale so you can measure a distance and work out how much that distance is in reality.



QUESTION 14

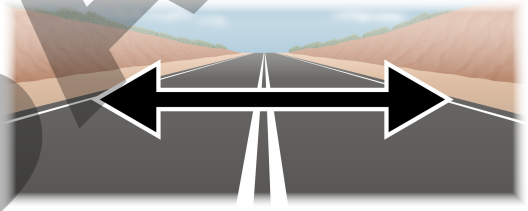
Give an example of when you would measure:

- Length
- Height
- Width
- Depth.

Length
Measuring how long a piece of timber is.

Height
Measuring how high a bridge is.

Width
Measuring how wide a road is.



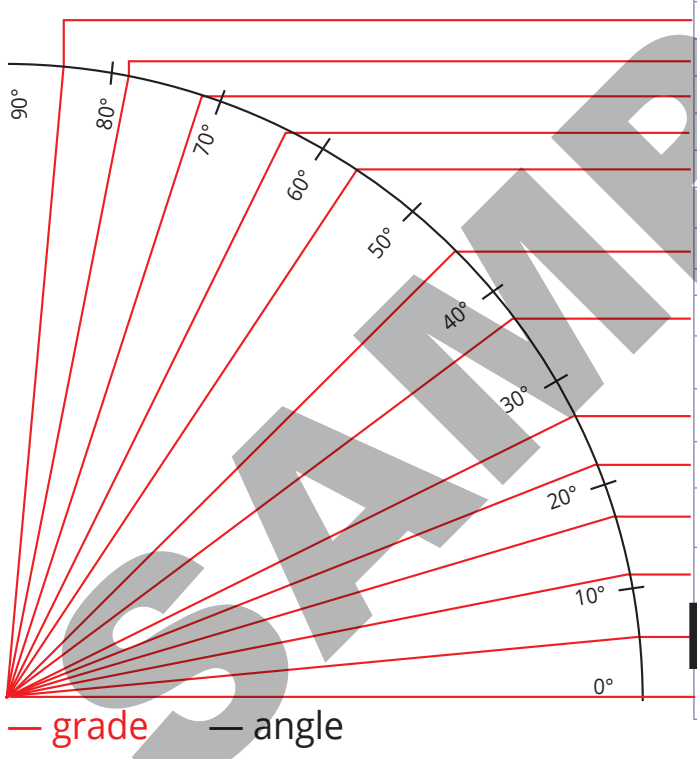
Depth
Measuring how deep a trench is.

Obtaining measurements (continued)

Gradient degrees

The easiest way to find out the angle of the gradient (degrees) is to use an online conversion tool or a table like the one below.

A Gradient of 0.1, 10% or 1:10 is equal to approximately a 5.71° angle.



Percentage	Ratio	Degrees
1000%	(10 in 1)	≈ 84.29°
500%	(5 in 1)	≈ 78.69°
300%	(3 in 1)	≈ 71.57°
200%	(2 in 1)	≈ 63.43°
150%	(3 in 2)	≈ 56.31°
100%	**(1 in 1)**	**= 45°**
75%	(3 in 4)	≈ 36.87°
50%	(1 in 2)	≈ 26.57°
40%	(2 in 5)	≈ 21.80°
30%	(3 in 10)	≈ 16.70°
20%	(1 in 5)	≈ 11.31°
10%	(1 in 10)	≈ 5.71°
0%		= 0°

QUESTION 15

What four (4) units of measure are used to describe length, height, width and depth?

The four units used are:

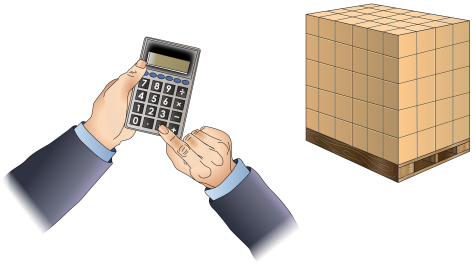
- Kilometres
- Metres
- Centimetres
- Millimetres

QUESTION 16

What are two methods that can be used to measure the weight of an object?

Weighing scales can be used to measure the weight of an object

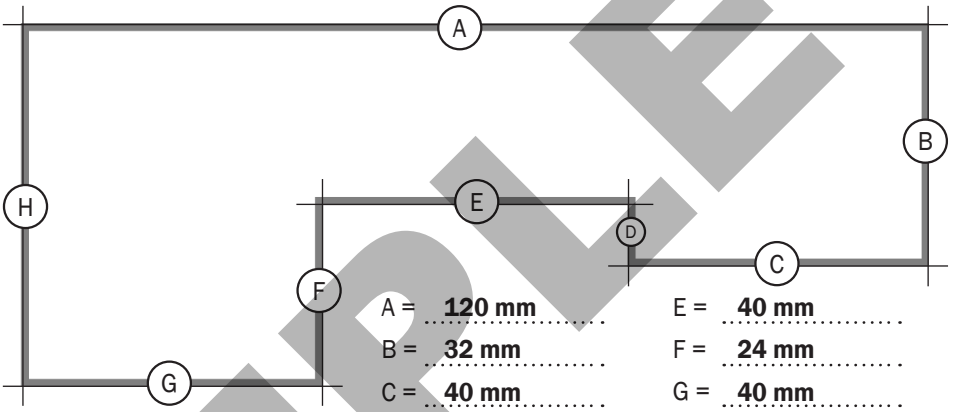
Calculations can be done to determine the weight of an object



QUESTION 17

Use a ruler to measure the perimeter of the space pictured.

Show your measurements in mm.

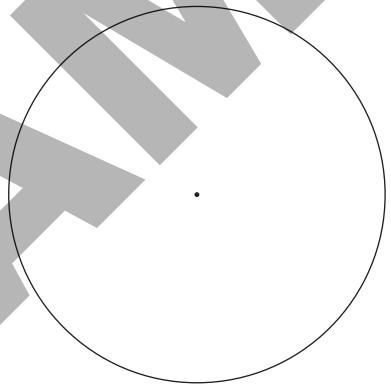


A = **120 mm**
B = **32 mm**
C = **40 mm**
D = **8 mm**
E = **40 mm**
F = **24 mm**
G = **40 mm**
H = **48 mm**

QUESTION 18

Use a ruler to measure both the diameter and radius of the circle pictured.

Record your answer in cm.



Radius = **2.5 cm**

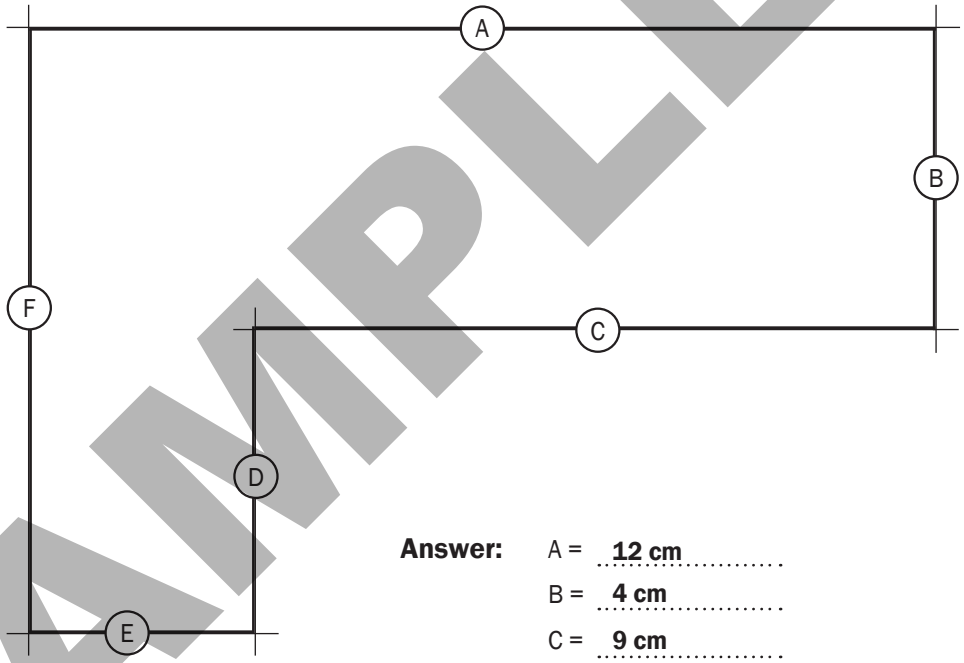
Diameter = **5 cm**

QUESTION 19

...CONTINUED FROM PREVIOUS PAGE

Use a ruler to measure and record the dimensions you need to find the area of the following shapes.

Find the following lengths and widths:



Answer:

A = **12 cm**

B = **4 cm**

C = **9 cm**

D = **4 cm**

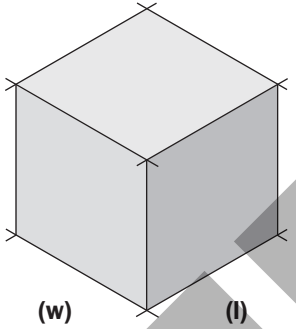
E = **3 cm**

F = **8 cm**

QUESTION 20

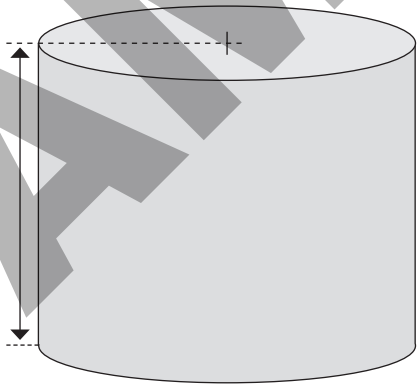
Use a ruler to measure and record the dimensions you need to find the volume of the following shapes.

Find the length, width and height:



Answer: Length = **2 cm**
Width = **2 cm**
Height = **2 cm**

Find the radius and height:



Answer: Radius = **2.5 cm**
Height = **4 cm**

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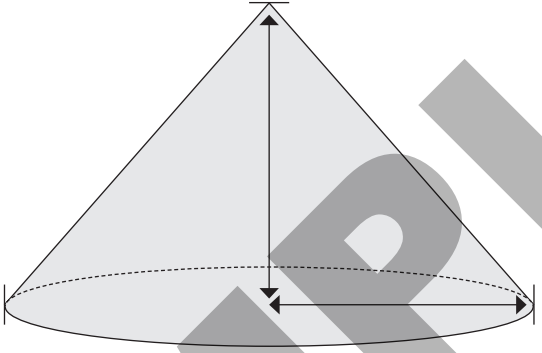
QUESTION 20

...CONTINUED FROM PREVIOUS PAGE

Use a ruler to measure and record the dimensions you need to find the volume of the following shapes.

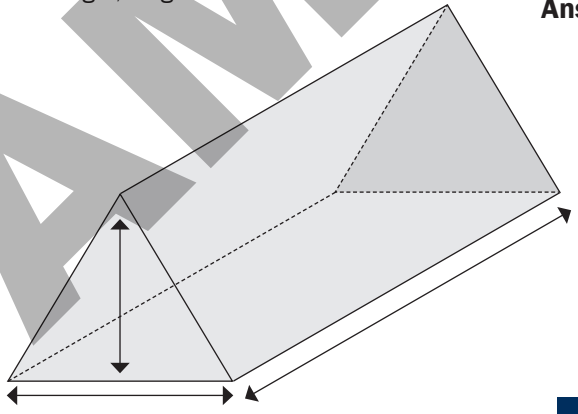
Find the height and radius:



Answer: Height = **4 cm**

Radius = **3.5 cm**

Find the height, length and width:



Answer: Height = **2.5 cm**

Length = **5 cm**

Width = **3 cm**

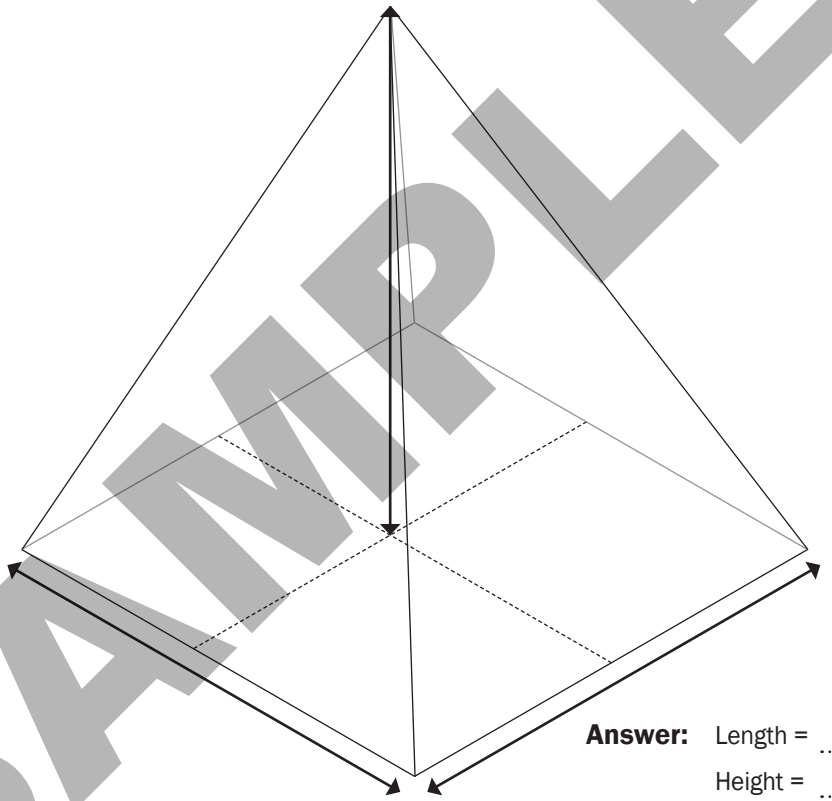
...CONTINUES ON NEXT PAGE

QUESTION 20

...CONTINUED FROM PREVIOUS PAGE

Use a ruler to measure and record the dimensions you need to find the volume of the following shapes.

Find the length, height and width:



Answer: Length = **6 cm**

Height = **7 cm**

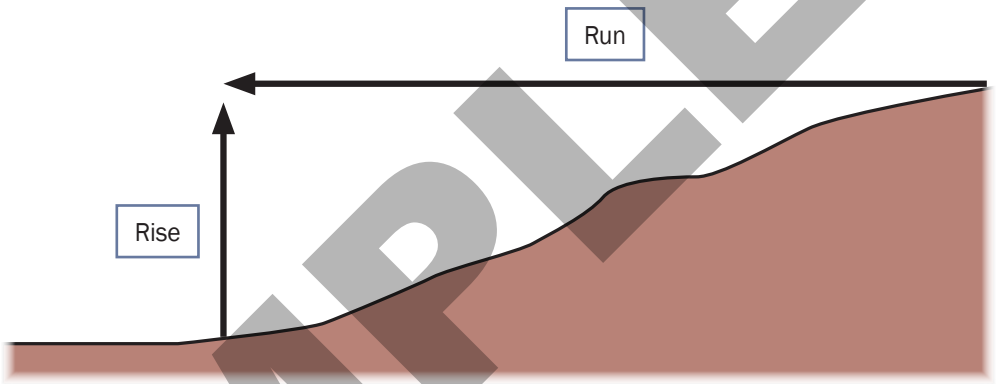
Width = **6 cm**

QUESTION 21

You need to measure the gradient of a slope on a jobsite.

What measurements need to be taken to work out the gradient?

The rise and the run of the slope.

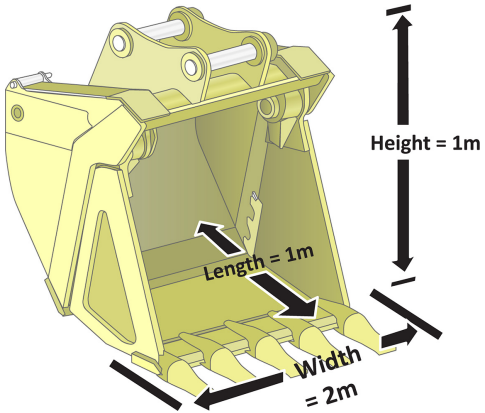


QUESTION 22

You need to work out how much soil an excavator bucket will hold.

What measurements do you need to take?

The length, width and height of the bucket so you can work out its volume.



PERFORM CALCULATIONS

Element 3

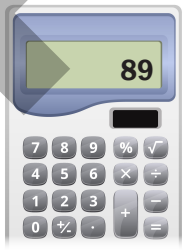
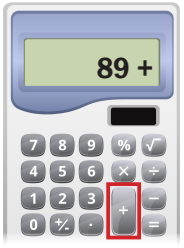
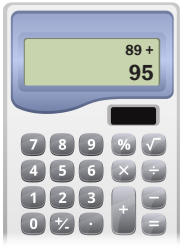
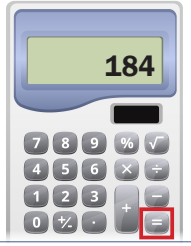
Select appropriate calculation method

There are a number of different ways to do calculations. The correct calculation method must be used for the job you are doing. If the wrong method is used you will end up with incorrect answers.

Addition (+)

Also known as **plus**, is used to work out the total amount or quantity of something by adding parts together. Addition is used when calculating perimeter, you add all the sides together to get a total.

Manual example	
1. Add 9 and 5 and you get 14. 89 + 95	2. Place the 4 down the bottom on the right and add the 1 to the 8 to make it 9. 9 ~~8~~9 + 95 4
3. Add 9 and 9 and you get 18. 9 ~~8~~9 + 95 4	4. Place the 18 down the bottom to the left of the 4 and you have the answer. 9 ~~8~~9 + 95 184

Electronic example	
1. Enter the number 89 	2. Press the **(+)** key 
3. Enter the number 95 	4. Press the **(=)** key and you will have your answer. 

QUESTION 38

Calculate the values for the following project and complete the quote.

Material costs and labour charges are:

Chain mesh – $9.50¢ p/m

Fence posts – $7.00 each

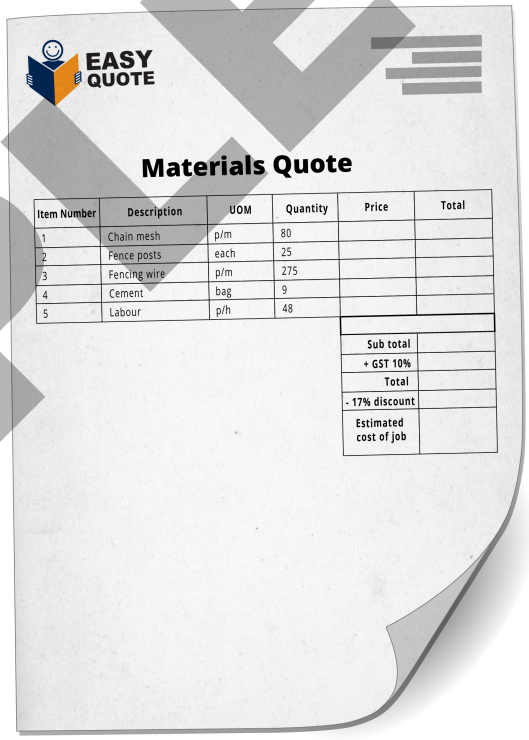
Fencing wire – $0.27¢ p/m

Cement – $8.75¢ per bag

Labour – $40.00 p/h

Goods and Services Tax (GST) – add 10% on the sub total price

Discount – Apply a 17% discount to the grand total.


EASY QUOTE

Materials Quote

Item Number	Description	UOM	Quantity	Price	Total
1	Chain mesh	p/m	80		
2	Fence posts	each	25		
3	Fencing wire	p/m	275		
4	Cement	bag	9		
5	Labour	p/h	48		

Sub total	
+ GST 10%	
Total	
- 17% discount	
Estimated cost of job	

Answer on the next page

...CONTINUES ON NEXT PAGE

QUESTION 38

...CONTINUED FROM PREVIOUS PAGE

Calculate the values for the following project and complete the quote.

Material costs and labour charges are:

Chain mesh – $9.50¢ p/m
Fence posts – $7.00 each
Fencing wire – $0.27¢ p/m
Cement – $8.75¢ per bag
Labour – $40.00 p/h
Goods and Services Tax (GST) – add 10% on the sub total price
Discount – Apply a 17% discount to the grand total.

Answer

Materials Quote

Item Number	Description	UOM	Quantity	Price	Total
1	Chain mesh	p/m	80	$9.50	$760.00
2	Fence posts	each	25	$7.00	$175.00
3	Fencing wire	p/m	275	$0.27	$74.25
4	Cement	bag	9	$8.75	$78.75
5	Labour	p/h	48	$40.00	$1920.00

Sub total	$3008.00
+ GST 10%	$300.80
Total	$3308.80
- 17% discount	$562.50
Estimated cost of job	$2746.30

Confirm and record results

It is important that all calculations are accurate. The results of manual calculations can be double checked by using a calculator to make sure they are correct.

You could also have a workmate check the results of your calculations to make sure they are accurate. If you get the information for your calculations from a plan make sure you read the plans carefully.

Double check the results of manual calculations using a calculator.

Get a workmate to double check the results of your calculations if possible.

Record or write down your calculations and the results clearly and neatly. You or someone else may need to look at them at another time.

Read plans carefully and make sure you have used the correct figures for your calculations.

QUESTION 39

You have measured and calculated the materials required for a job and prepared the quote.

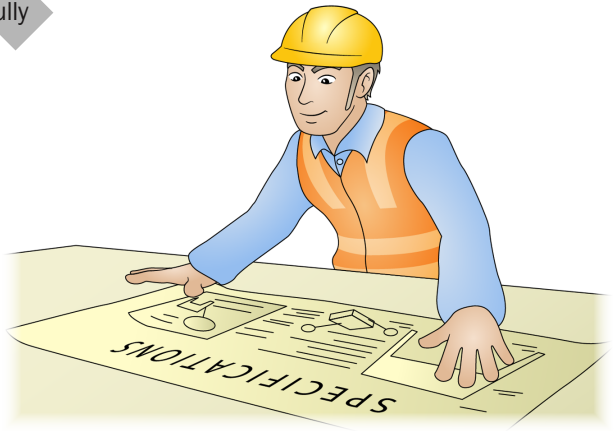
What should you do before giving the final quote to the customer?

The quote should be double checked to make sure it is accurate.

QUESTION 40

What should you do when preparing a quote based on information you have read from a plan?

Make sure you read the plan carefully and use the correct information.



ESTIMATE QUANTITIES

Element 4

Select appropriate formulas

It is important to use the correct formulas when making a calculation. If the wrong formula is used the answer will not be correct.

An incorrect answer can affect:

- The quality of work
- Safety
- Profit/loss
- Deadlines.

For example:

To calculate how much water it will take to fill a swimming pool the formula for volume should be used.

If the formula for area was used instead, the answer would be incorrect and there would not be enough water to fill the pool.

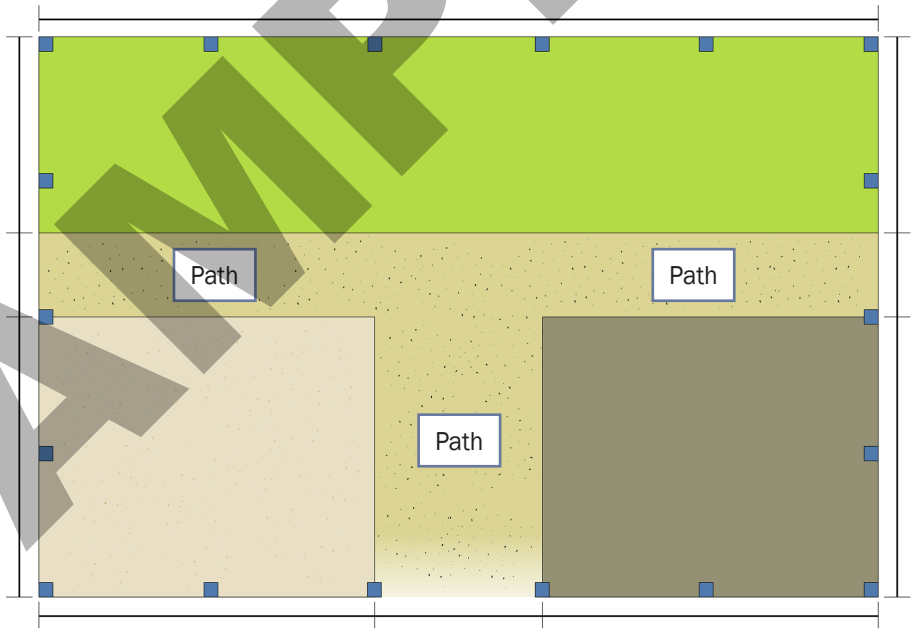
Select appropriate formulas (continued)

The project in this example is to construct a concrete path in the children's play area based on the dimensions in the drawing on page 115 and details on page 116. (Refer to these pages).

Before commencing the job the amount of materials that will be required to construct the path need to be calculated.

Materials required are:

- Wire mesh concrete re-enforcement
- Road base (50 mm)
- Concrete (100 mm)

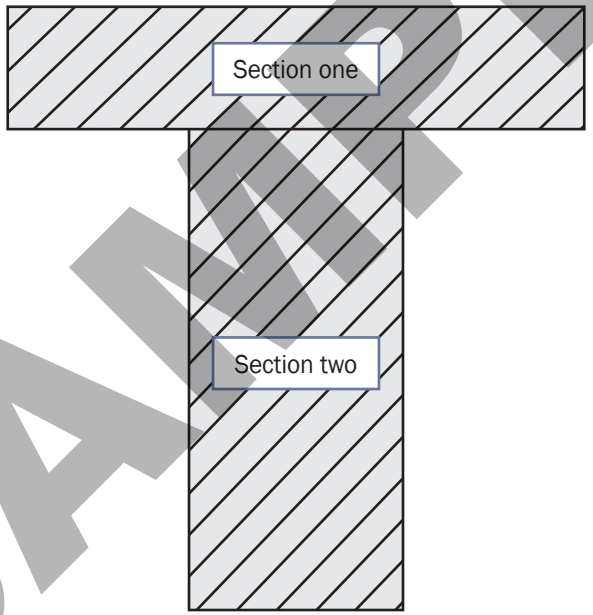


Select appropriate formulas (continued)

Wire mesh re-enforcement

The correct formula to use to work out how much wire mesh re-enforcement is needed is length times width (l × w) or area (m^2). The wire mesh only has to cover the surface area of the path, the thickness (depth) is not important.

If the volume was calculated instead of the area, there would be too much re-enforcement for the job.

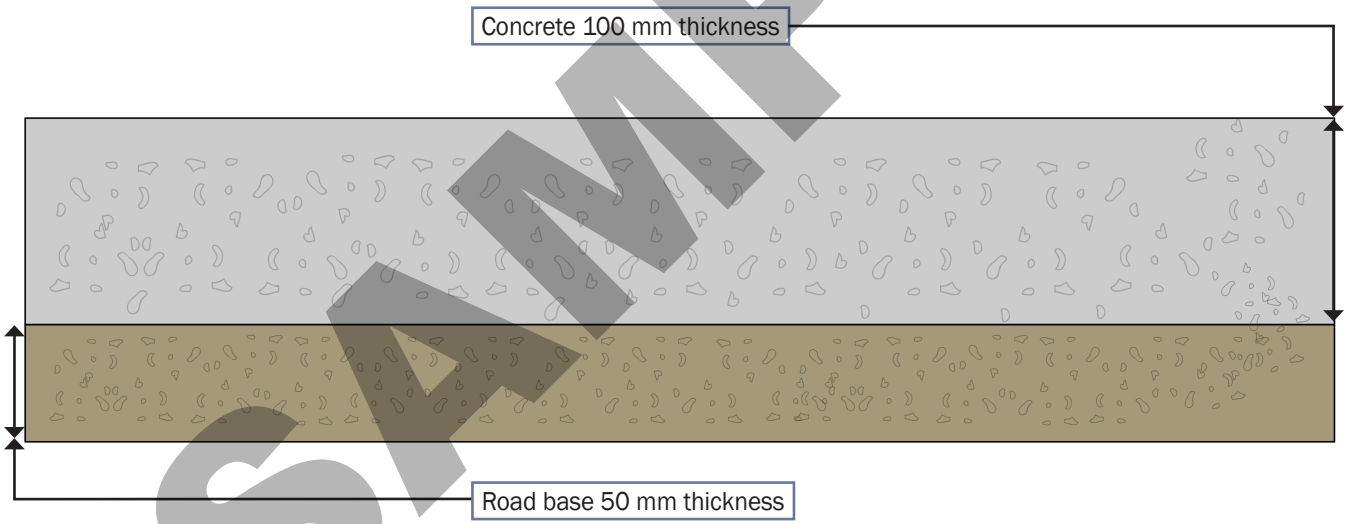


Select appropriate formulas (continued)

Concrete and road base

The correct formula to use to work out how much concrete and road base is needed is length time's width time's height (l × w × h) or volume (m^3). The concrete and road base have to fill the entire space so the thickness (depth) is important.

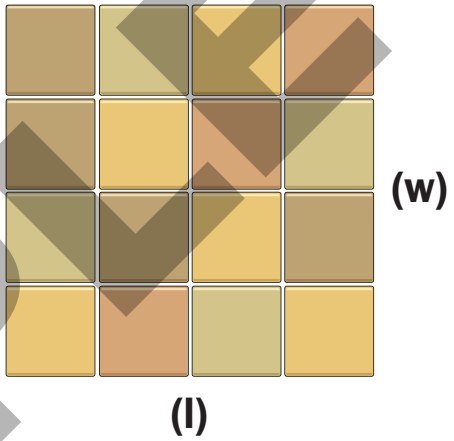
If the area was calculated instead of the volume, there would not be enough concrete to do the job.



QUESTION 41

What is the appropriate formula for calculating how many wall tiles would be required to cover a wall?

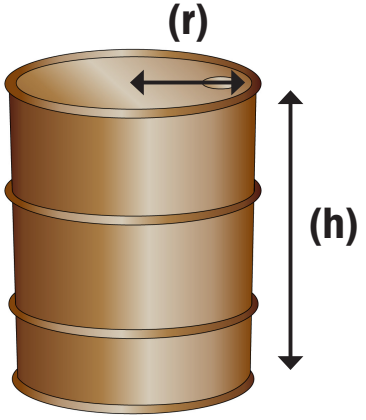
The appropriate formula is area (l × w).



QUESTION 42

What is the appropriate formula for calculating how much water a tank can hold?

Volume (Pi × r^2 × h)



Make calculations for determining quantities

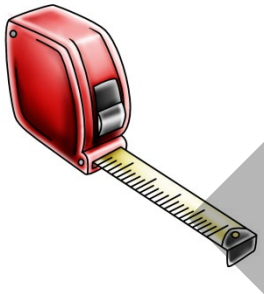
Wire mesh calculation

The area of the path needs to be calculated to work out how much wire mesh re-enforcement will be needed. Because the path is a 'T' shape, this will be done in two sections and then the two sections added together for the answer.

To calculate the area of **section one** multiply the **l** and **w.** **(l)** 15.0 m × **(w)** 1.5 m =	The area of **section one** is: **22.5 m²**
To calculate the area of **section two** multiply the **l** and **w.** **(l)** 3.0 m × **(w)** 5.0 m =	The area of **section two** is: **15.0 m²**
Add the two sections together to get the total area. Section one **22.5 m²** + Section two **15.0 m²** =	The total area of the path is: **37.5 m²**

RIICCM201E Carry Out Measurements and Calculations

Review—Knowledge questions (Formative Assessment)



Elements

1. Plan and Prepare for Measurements and Calculations
2. Perform Measurements
3. Perform Calculations
4. Estimate Quantities

This resource developed by:

EASY GUIDES Australia Pty Ltd

Name: _____

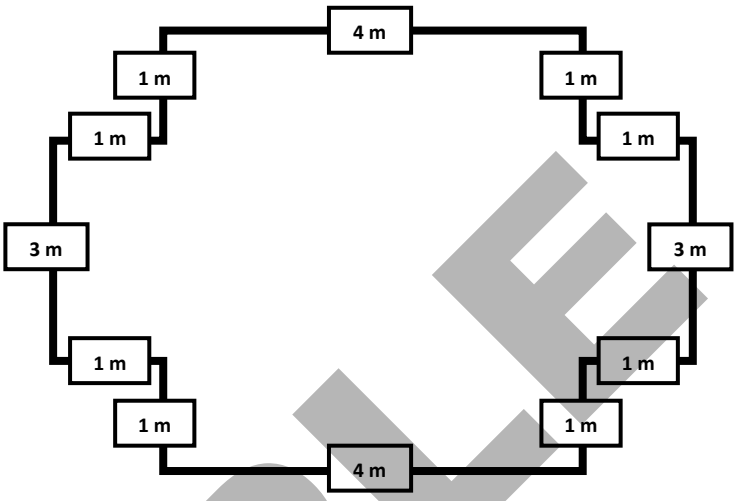
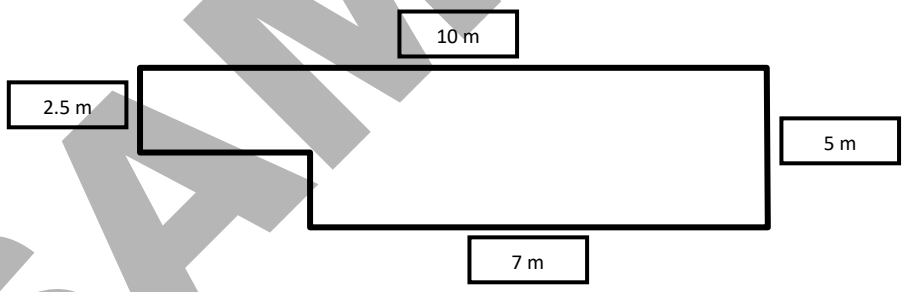
Date: ____ / ____ / ____

Student Number: _____

PC	Question Number	Element 1 - Plan and prepare for measurements and calculations
1.2	1-A	**Before performing measurements and calculations you must make sure your work is compliant. Name five (5) documents that can assist you.**
1.2	1-B	**Where can you find information on OHS/WHS legislation?**
1.1	1-C	**How can work requirements be communicated?**
1.1	1-D	**Why is it important to complete a JSEA?**
1.3	1-E	**How do you make sure tools and equipment are safe and in good working order?**
1.3	1-F	**What can happen if you try and measure something with a damaged tape measure?**
1.2	1-J	**How do we confirm that work performed is compliant? Using Range Hood above gas hob as an example.**

PC	Question Number	Element 2 – Perform measurements
2.1	2-A	**If you were asked to measure the perimeter of something, what would you measure?**
2.1	2-B	**Complete the sentences below using the following words: Length, width, height, depth.** I needed to find the distance from the floor of the building to the ceiling so I measured the **……** of the wall. To find the area of the job site I had to measure the **…….** and the width. Length, height and **…….** is measured to find the volume of a 3 dimensional space. To measure the **……** of a trench you measure from the top of the trench to the bottom of the trench.
2.1	2-C	**What are the standard units of measure for area and volume?** Area = Volume =
2.1	2-D	**Describe two (2) types of scale that can be used for measuring.**
2.1	2-E	**What two areas of a slope would you need to measure to find the gradient?**

PC	Question Number	Element 2 – Perform measurements
2.2	2-F	**You need to work out the area of a triangular shaped space, what measurements do you need to take?**
2.2	2-G	**What measurements do you need to find out the area of a circle?**
2.2	2-H	**What measurements do you need to take to work out the volume of a cube?**
2.2	2-I	**What measurements do you need to take to work out the volume of a cylinder?**
2.3	2-J	**Why is it important to double check measurements?**

PC	Question Number	Element 3 – Perform Calculations
3.1	3-A	**Calculate the perimeter of the shape below.** 
3.1	3-B	**Calculate the area of the shape below. (show all workings)** 
3.1	3-C	**You have a 20 m³ hole to backfill using an excavator. The excavator bucket moves 0.8 m³ per load. It takes 2 minutes to dump each load in the hole. How long will the hole take to fill? (show all workings)**

<table>
<tr><th>PC</th><th>Question Number</th><th>Element 3 – Perform Calculations</th></tr>
<tr><td>3.1</td><td>3-D</td><td>There is a stockpile of top soil on site which contained 36.2 m³ of soil. 2 loads of 5.3 m³, 3 loads of 3.4 m³ and 1 load of 9.6 m³ have been removed. One job remains which needs 6.0 ³m. Is there enough top soil to do the job? (Show all workings)</td></tr>
<tr><td>3.1</td><td>3-E</td><td>A slope has a rise of 3 m over a 24 m run. What is the gradient of the slope? Show your answer as a number, fraction, ratio and percentage. (show all workings)
<table>
<tr><td>Number</td><td>Fraction</td></tr>
<tr><td>Ratio</td><td>Percentage</td></tr>
</table>
</td></tr>
<tr><td>3.2
3.3</td><td>3-F</td><td>Use the information provided to prepare a customer quote on the following page. The materials required are:

25 cubic metres of top soil @ $25.00 per cubic metre
5 cubic metres of orange brick sand @ $62.00 per cubic metre
20 cubic metres of packing sand @ $47.00 per cubic metre
10 sheets of reinforcing mesh @ $67.00 per sheet
200 bar chairs @ $19.95 per bag of 100
2 rolls of heavy duty builders plastic @ $85.00 per roll
12 bags of builders cement @ $7.62 per bag
20 cubic metres of recycled road base @ $35.00 per cubic metre
28 treated pine sleepers @ $27.95 each
8 H-beam retaining wall brackets @ $12.60 each
160 hours labor @ $47.25 per hour</td></tr>
</table>

Easy Construction Company – Quote for works					
Item Number	**Description**	**UOM**	**Quantity**	**Price**	**Total**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

	Sub total		
	+ GST 10%		
	Total		
	-15% discount		
	Estimated cost of materials and labor		

PC	Question Number	Element 4 – Estimate Quantities
4.1 4.2 4.3	4-A	A 40 m long trench has been dug and had sewer pipes laid in it. You are required to organise crushed rock to fill the trench to the height of the sewer pipes, and topsoil to fill the remainder of the trench. A quantity of instant turf also needs to be ordered to cover the topsoil. Select the appropriate formulas and calculate the following: • Quantity of crushed rock needed • Quantity of topsoil needed • Quantity of instant turf needed • Round all results up to the nearest 10. The trench is 2.2 m deep and 2.2 m wide. The sewer pipe has an OD of 1100 mm.
4.4	4-B	**What are the three (3) types of tolerance that may be allowed when taking measurements and calculations?**

PC	Question Number	Element 0 – General Questions.
1.2	5-A	**If you had left over cut offs from missed measurements, what sort of problems would this cause.**

2.1	5-B	**When taking measurements how does work health and safety procedures fit into your work environment of work. Describe a situation where OHS might affect you taking measurements.**

1.2	5-C	**In the event of an accident when taking a measurement what procedures document should you follow.**

Further training needed:

Note: Formative assessment is designed to check on a learner's progress during the training period. Further training and experience may be needed if learner has not completed all tasks to a satisfactory level.

Mapping Tool

RIICCM201E Carry out measurements and calculations

Note: This completed document shows that the enclosed learning materials have been mapped against the Unit of Competency.

Legend

PC	Performance Criteria
PE	Performance Evidence
KE	Knowledge Evidence

Application

This unit describes the skills and knowledge required to carry out **measurements** and **calculations** in the resources and infrastructure industries. It includes using measurements and calculations to estimate quantities for various work activities.

It applies to those working in operational roles.

They generally work under supervision to undertake a prescribed range of functions involving known routines and procedures and take responsibility for the quality of own work outcomes.

Licensing, legislative and certification requirements may apply to this unit can vary between states, territories and industry sectors. Users must check requirements with relevant body before applying the unit.

Unit Sector

Civil construction

Section 1 – Performance Criteria

Performance Criteria (PC)	Learner Guide & Multimedia Presentation	Review Questions & Practical tasks (Formative Assessment)		Test Paper (Summative Assessment)		RTO to fill out (Customised and additional materials, eg. web sites, DVDs, handouts…)
		Review Question	Practical Training Task	KNOWLEDGE	PRACTICAL	
Element 1 Plan and prepare for measurements and calculations			**Doc 6**	**Doc 7 & 8**	**Doc 7 & 8**	
1.1 Obtain, interpret and confirm work requirements	**Element 1** Work requirements, JSEA, SWMS. **Question** 3, 4.	1-C, 1-D	Task 1, 2	1-C, 1-D, 1-E	1-A	
1.2 Access, interpret and apply documentation and procedures	**Element 1** Compliance documents. **Question** 1a, 2, 1b, 1c	1-A, 1-B, 1-J	Task 1, 2	1-A, 1-B, 1-I-B, 1-J	1-A	
1.3 Select the appropriate plant and equipment and check for faults	**Element 1** Select and check tools and equipment, calibration. **Question** 5, 6.	1-E, 1-F	Task 3	1-F, 1-G, 1-H, 1-I	1-A	

Performance Criteria (PC)	Learner Guide & Multimedia Presentation	Review Questions & Practical tasks (Formative Assessment)		Test Paper (Summative Assessment)		RTO to fill out (Customised and additional materials, eg. web sites, DVDs, handouts…)
		Review Question	Practical Training Task	KNOWLEDGE	PRACTICAL	
Element 2 Perform measurements						
2.1 Select and apply the appropriate method of obtaining the measurement required	**Element 2** Measurement methods, length, height, width, depth, perimeter, circumference, diameter, radius, area, volume, weight, mass, scale, gradient. **Question** 7, 8, 9, 10, 11, 12, 13, 14.	2-A, 2-B, 2-C, 2-D, 2-E	Task 4	2-A, 2-B, 2-C, 2-D, 2-E, 2-F, 2-G, 2-H, 2-I	2-A	
2.2 Obtain measurements using appropriate plant and equipment and confirm the required accuracy	**Element 2** Obtaining measurements, length, height, width, depth, short distances, medium distances, long distances, circumference, diameter, radius, area of a square or rectangle, triangle, circle, trapezoid, parallelogram, ellipse, volume of a cube, cylinder, cone, pyramid, triangular prism, weight and mass, weighing scales, measuring to calculate weight, gradient. **Question** **15, 16, 17, 18, 19, 20, 21, 22.**	2-F, 2-G, 2-H, 2-I	Task 4	2-J, 2-K, 2-L	2-A	