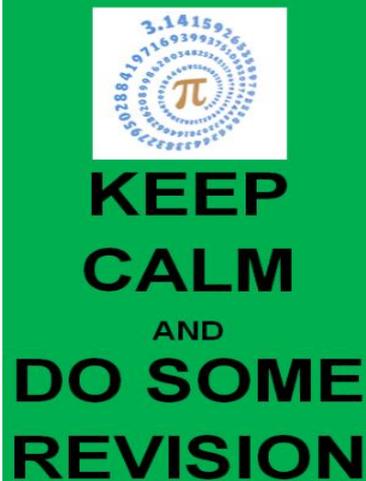


## Goals

Test and Revision:

**HAVE YOU GOT A CALCULATOR? (you CANNOT use your phone)**

- Interpret commonly used symbols and abbreviations in scale drawings, find actual measurements from scale drawings, such as length, perimeters, and areas
- Estimate and compare quantities, materials and costs using actual measurements from scale drawings; for example, using measurements for packaging, clothes, painting, bricklaying, and landscaping
- Understand and apply drawing conventions of scale drawings, such as scales in ratio, clear indications of dimensions, and clear labelling and to construct scale drawings by hand and by using software packages



## Theoretical Components

**Revision resources:**

*PDF file:* Week 1-7 Notes and Exercises

**Resources for this week:**

*PDF file:* Week 9 Notes and Exercises

**Knowledge Checklist:**

Week 1/2

- Review of units of measurement
- Abbreviations and conversions
- Perimeters of familiar shapes
- Metric units of area
- Use formulas to calculate perimeters of familiar shapes

Week 3

- Using nets to visualise surface area
- Surface area of prisms, spheres and cylinders
- Surface areas of irregular shapes

Week 4/5

- Conversion factors for volume
- Units of capacity
- Relationship between volume and capacity

Week 6/7

- 2D and 3D shapes and properties
- Faces, edges, vertices
- Angles
- Points, line, segments, and rays

## Practical Components

Go through your folders and complete any missing tasks and review any questions that are incorrect. **GET YOUR OWN CALCULATOR!!!**



## Portfolio Task

Your classwork and portfolio tasks make up 25% of your grade for this semester.

Make sure you have handed in any unsubmitted work before the exam. This will all your teacher to provide you some feedback prior to the exam.

Organise your folders in preparation for your test.

## Exam

Have you organised your folders yet? Don't forget you are allowed to take your classwork to the test as reference. **GET YOUR OWN CALCULATOR!!!**

### Scale drawings

A scale drawing is usually a reduction of a real object, such as a building, but can be an enlargement of a very small object, such as a computer chip.

Scales on a diagram are usually given as:

- A statement such as 1 cm represents 2 m
- A ratio such as 1:100

### Example 1

Patrick is using a map with a scale 1 cm represents 2 km. How far would he have to walk if the distance on the map is 6 cm?

### Solution

We need to multiply the scaled distance by the scale.

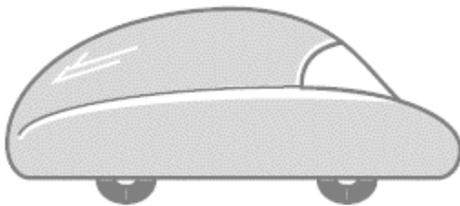
$$6 \times 2 \text{ km} = 12 \text{ km.}$$

### Exercise 1

## HAVE YOU GOT A CALCULATOR FOR THE EXAM?

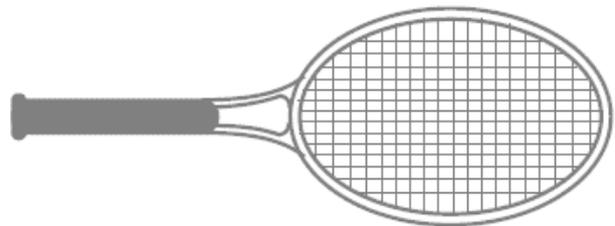
1. By measurement and calculation, find the real length of these objects.

a.



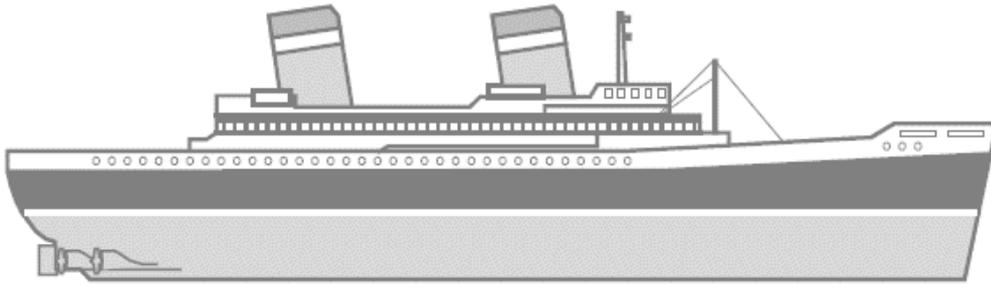
Robocar 1 : 100

b.



Tennis racquet 1 : 12

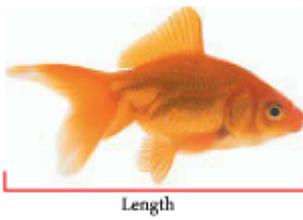
c.



Ship 1 : 3000

d.

Fish 1 : 3



Length

e.

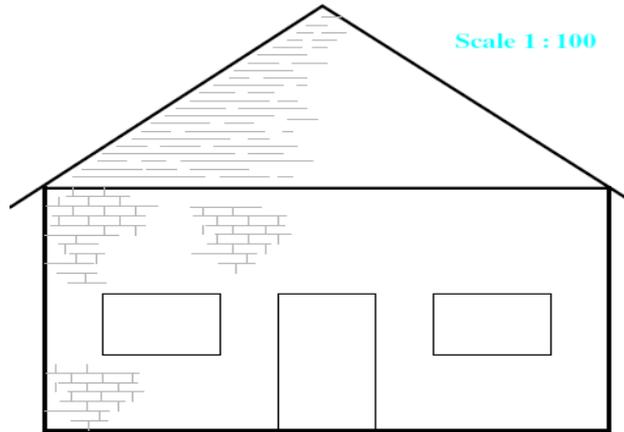
House 1 : 300



Height

**HAVE YOU GOT A CALCULATOR FOR THE EXAM?**

2. A house is drawn to scale as shown.



- a. What does the scale of 1:100 mean?
  
  
  
  
  
  
  
  
  
  
- b. If the height of the door in the drawing is 18 mm, what is its actual height?
  
  
  
  
  
  
  
  
  
  
- c. Find the actual width of the house
  
  
  
  
  
  
  
  
  
  
- d. Find the actual height from ground level to the ceiling

3. When the ratio for the scale is given in the reverse order, this means that the object is smaller than the scale drawing. In this case, we divide by the scale. The drawing of a screw is drawn to a scale 5:1



Scale 5 : 1

Scaled length of the screw = \_\_\_\_\_ cm

Actual length of the screw = \_\_\_\_\_ ÷ 5

Actual length of the screw = \_\_\_\_\_ cm

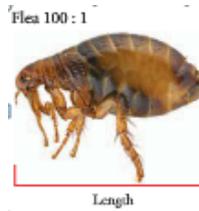
4. By measurement and calculation, find the real length of these objects.

a.



Ant 4 : 1

b.

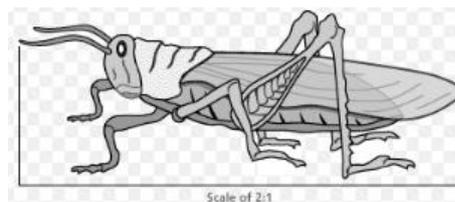


c.

Microchip 3 : 1



d.



Scale 2:1

e.



Bacteria 100:1

f.



Scale 25:1

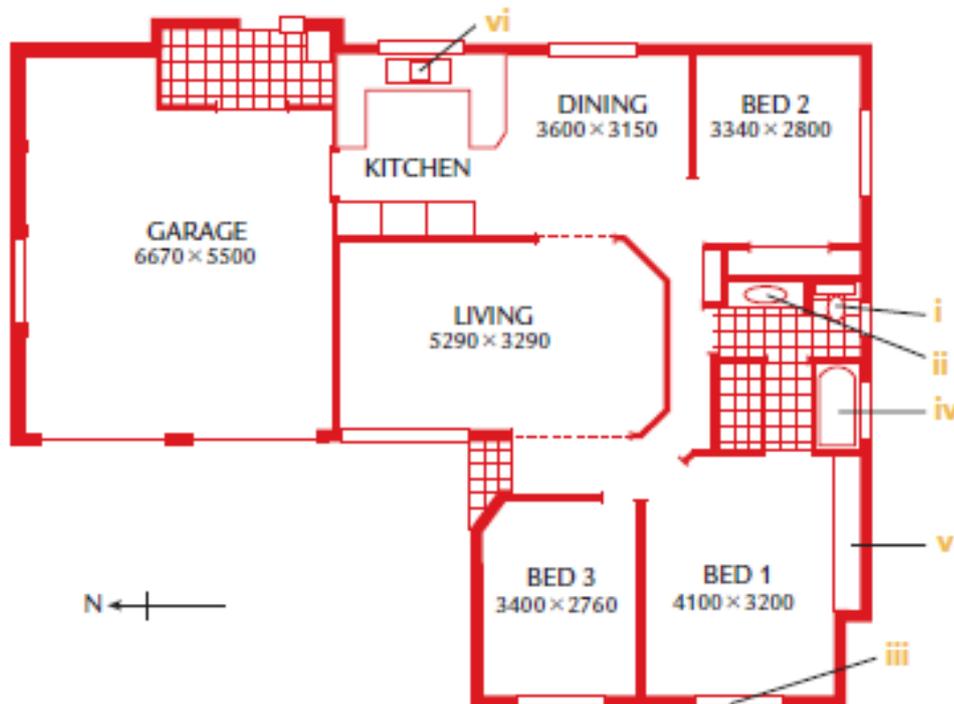
**HAVE YOU GOT A CALCULATOR FOR THE EXAM?**

**Floor plans**

Plans for buildings are one of the most common uses of scale diagrams. Each house, office block, school or any other building must have plans drawn up before it can be built. House plans use many different symbols and abbreviations. They are either drawn to scale or have measurements written on them. Measurements on building plans are usually shown in millimetres to avoid the use of decimal points as decimal points can lead to errors in printing and reading.

**Exercise 2**

1. Use this floor plan to answer the following questions



a. What does each of these features on the plan represent?

i.



ii.



iii.



iv.



v.



vi.



b. Three areas on the plan are covered in small squares. What do the areas have in common?

c. How many bedrooms are in the house?

d. Which bedrooms have built-in wardrobes?

e. Where is the laundry?

f. How many doorways lead into the bathroom?

g. Which room is 5.29 m long and 3.29 m wide?

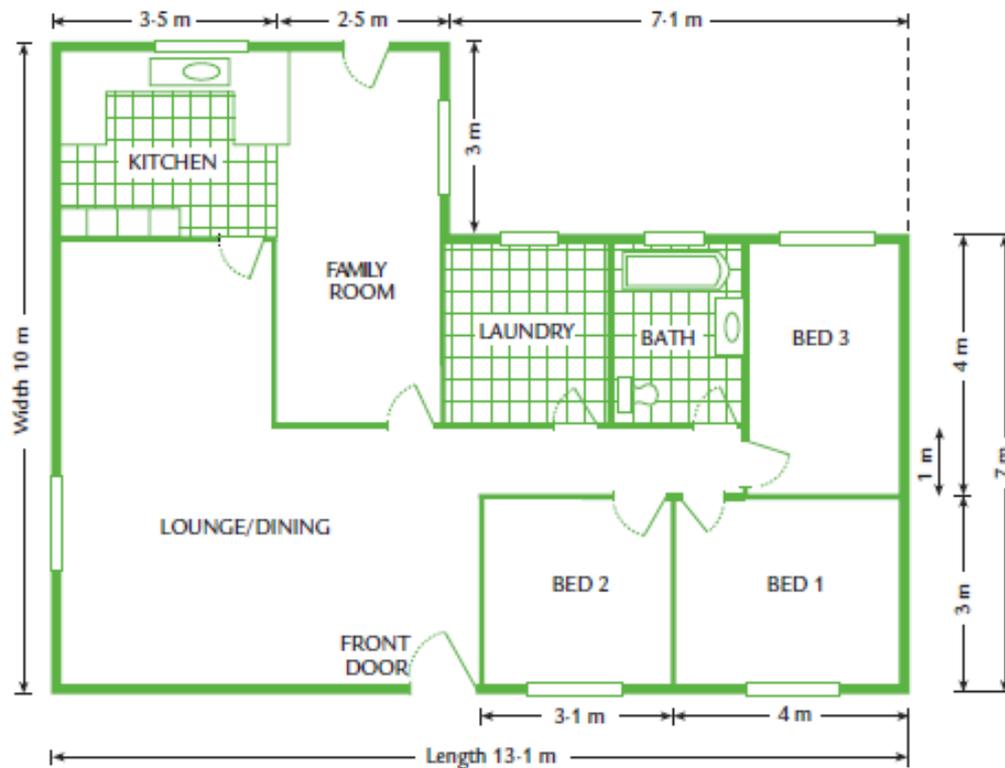
h. What are the dimensions of the garage, in metres?

i. Can a person standing at the front door see into the bathroom?

j. Which rooms will get sun in the morning?

k. Which rooms will get no direct sunlight?

2. Use this floor plan to answer the following questions



a. How many doors are shown on the plan?

b. What are the length and width of the house?

c. Calculate the width of the kitchen.

- d. Calculate the floor area of the house.
- e. What is the ratio of the area of bedroom 1 to the area of bedroom 2?
- f. What percentage of the floor area of the house is the area of bedroom 1?
- g. The builder is going to put tiles on the family room floor. What is the area of the family room floor? The builder always buys 10% more than the floor area when he buys tiles. How many square metres of tiles will he buy for the family room?
- h. The roof guttering, which goes all the way around the house, will cost \$24.75 per metre. Calculate the cost of the guttering.
- i. The floor area of the house is 25% of the area of the block of land. Calculate the area of the block of land.
- j. The block of land is a rectangle. What possible dimensions could the block have?

3. Match the word (1 to 9) to its correct meaning (A to I).

- |               |   |
|---------------|---|
| 1 centimetre  | A A unit used to measure long distances                       |
| 2 enlarge     | B The relationship between a real-life object and its diagram |
| 3 house plans | C A unit used to measure medium lengths                       |
| 4 kilometre   | D To make a drawing or object larger                          |
| 5 metre       | E Something used to illustrate aspects of a house plan        |
| 6 millimetre  | F A unit used to measure small lengths                        |
| 7 reduce      | G A diagram showing rooms and measurements                    |
| 8 scale       | H A unit used to measure very small lengths                   |
| 9 symbols     | I To make a drawing or object smaller                         |

### Producing scale drawings

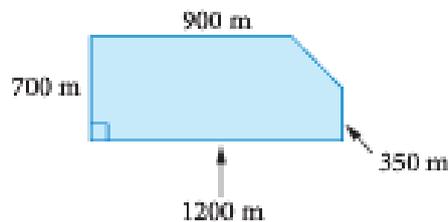
**HAVE YOU GOT A CALCULATOR FOR THE EXAM?**

When we want to make scale drawings, we usually start with a rough sketch that has the measurements we need on it. We then choose a scale and draw the objects accurately.

We can also use our scale drawings to find other measurements.

### Example 2

This is a rough sketch of Farmer Fred's field. Draw a scale drawing of Farmer Fred's field.



### Solution

A suitable scale to use is  $1 \text{ cm} = 200 \text{ m}$ .

We can use this to calculate the scaled length for each measurement by dividing by the scale.

$$900 \div 200 = 4.5 \text{ cm}, \quad 700 \div 200 = 3.5 \text{ cm}, \quad 1200 \div 200 = 6 \text{ cm}, \quad 350 \div 200 = 1.75 \text{ cm}$$

Use these measurements to draw a scale drawing.

**HAVE YOU GOT A CALCULATOR FOR THE EXAM?**

### Example 3

Hanna is going on a bushwalk from her camping site. She walks 2.5 km due East then 1.9 km due Northwest.

- Draw a scale diagram of Hanna's walk.
- By measurement calculate how far Hanna is from her camp site.

### Solution

A suitable scale to use is  $1 \text{ cm} = 0.5 \text{ km}$ .

$2.5 \div 0.5 = 5 \text{ cm}$ ,  $1.9 \div 0.5 = 3.8 \text{ cm}$ . The angle between West and Northwest is  $45^\circ$ .

Construct a diagram using a ruler and protractor. It should look something like this.

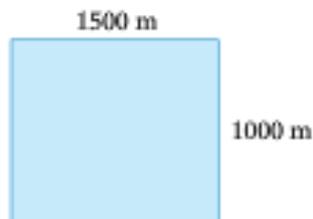


Complete the triangle and measure the third side. The third side turns out to be 3.5 cm.

$3.5 \times 0.5 = 1.75$ , this means that Hanna is 1.75 km from her camp site.

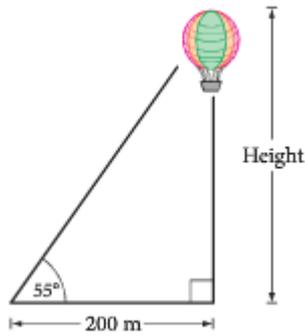
### Exercise 3

- This diagram is not to scale. Make a scale drawing of this field using a scale of  $1 \text{ cm} = 500 \text{ m}$ .

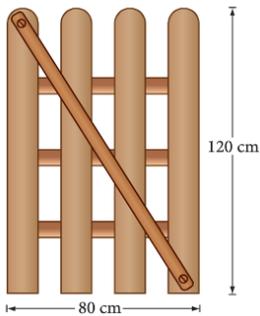


- Maggie and Sonja are setting off on a hike. They walk 5 km due West of their starting point and then turn and walk 7 km South. They stop for lunch and then walk another 6 km in a North-easterly direction before stopping for afternoon tea.
  - Make a scale diagram of their walk using a scale of  $1 \text{ cm} = 1 \text{ km}$ .
  - How far are they from their starting point?

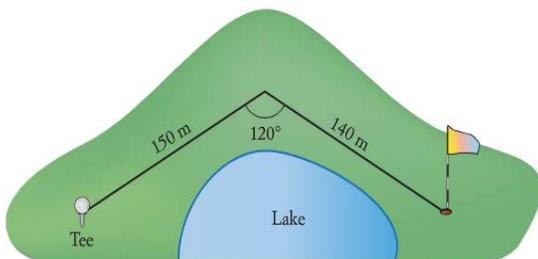
3. Construct a scale diagram to calculate the actual height of the hot air balloon above the ground. Use a scale of  $1 \text{ cm} = 50 \text{ m}$ .



4. An old wooden gate needs a diagonal brace for support. Construct a scale drawing of the gate and find the actual length of the brace. Use a scale of  $1 \text{ cm} = 40 \text{ cm}$ .

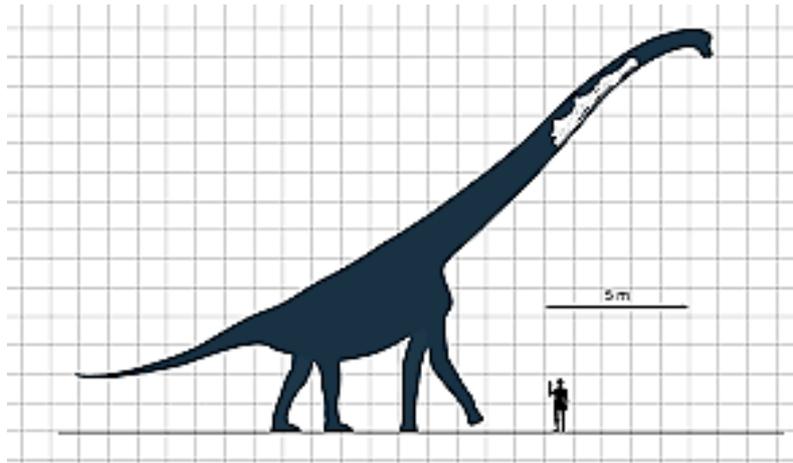


5. A golf course has a large lake as an obstacle. Most golfers follow the god leg around the lake. How far is it in a straight line across the lake, from the tee to the hole? (use your own scale)



**HAVE YOU GOT A CALCULATOR FOR THE EXAM?**

## Portfolio Task Week 9



1. In the scale drawing above, what is the dimension of each square?
2. What is the height of the man?
3. What is the height of the sauropod?
4. Measure the height of the sauropod in centimetres.
5. Use these measurements to calculate the scale of this drawing. Show your working.
6. The man's height is what percentage of the sauropod's height? Show your working.

## MARKING RUBRIC

CRITERIA	EXPECTATIONS	POSS	MULT	GIVEN	TOTAL
<b>Practical</b>	Student completes practical work, including exercises and Mathspace task, of the brief to an acceptable standard set by the teacher.	2	3		/6
<b>Portfolio Task</b>	Student completes the investigation task of the week to an acceptable standard set by the teacher.	2	2		/4
<b>Reasoning and Communications</b>	Student responses are accurate and appropriate in presentation of mathematical ideas, with clear and logical working out shown.	4	-		/4
<b>Concepts and Techniques</b>	Student submitted work selects and applies appropriate mathematical techniques to solve practical problems and demonstrates proficiency in the use of mathematical facts, techniques and formulae.	4	-		/4
	<b>Submission Guidelines</b>				
<b>Timeliness</b>	Student submits the exercises, Mathspace task and investigation by the set deadline. See scoring guidelines for specific details.	2	-		/2
				<b>FINAL</b>	<b>/20</b>

### Student Reflection:

How did you go with this week's work? What was interesting? What did you find easy? What do you need to work on?