

Skills for Success Curriculum Resource Cover Page

Organization

College Sector Committee for Adult Upgrading (CSC)

Curriculum Resource

Refresher: Perimeter and Area (Rectangles and Triangles)

In this activity learners will complete a quick review of calculating perimeter and area for rectangles and triangles, including a review of units of measurement. Examples and practice questions are also provided, as well as a short activity involving applied calculations. Solutions are included at the end.

OALCF Alignment

Competency	Task Group	Level
Competency A -Find and Use Information	A1. Read continuous text	2
Competency A -Find and Use Information	A2. Interpret documents	2
Competency C - Understand and Use Numbers	C3. Use measures	3

Goal Paths (check all that apply)

- | | |
|---|---|
| <input checked="" type="checkbox"/> Employment | <input checked="" type="checkbox"/> Postsecondary |
| <input checked="" type="checkbox"/> Apprenticeship | <input checked="" type="checkbox"/> Independence |
| <input checked="" type="checkbox"/> Secondary School Credit | |

Embedded Skills for Success (check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Adaptability | <input checked="" type="checkbox"/> Numeracy |
| <input type="checkbox"/> Collaboration | <input checked="" type="checkbox"/> Problem Solving |
| <input type="checkbox"/> Communication | <input checked="" type="checkbox"/> Reading |
| <input type="checkbox"/> Creativity and innovation | <input type="checkbox"/> Writing |
| <input type="checkbox"/> Digital | |

Notes:

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Perimeter and Area (Rectangles and Triangles: A Refresher for Learners)

Learning in this Activity

At the end of this activity, you should be able to:

- Explain why including units is important when recording a measurement
- Calculate perimeter of a shape when given measurements
- Calculate area of a rectangle and triangle when given measurements

Why study perimeter and area?

Measurement happens daily in most of our lives. We measure time to cook a meal, speed when we drive, distance for a run, and more.

Perimeter and area are used to

- estimate how much of a material you need for a home reno project
- plot a walk or run route
- estimate how much wrapping paper you need
- and more

Units – Why are they Important?

When measuring anything, it is very important to include units. Without units, your measurement has no meaning!

For example, if someone says, “I have five!” do you know what they mean? It could be five dogs, five dollars, or five marbles. The units are needed to understand what they are talking about. If they say, “I have five oranges.” you know what they mean right away.

When you are taking measurements of any kind,

always include the units!

For ALL perimeter and area calculations, the measurements must have the same units within the calculation.

Make sure your units match!

Please ask your instructor if you need more information on converting measurements.

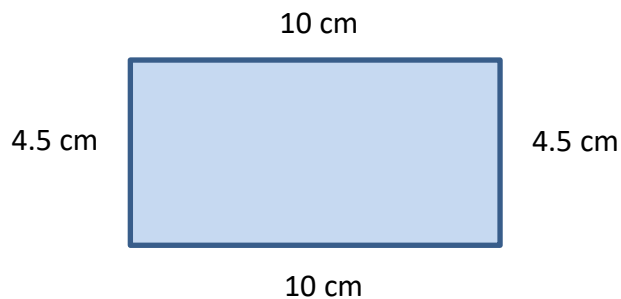
Perimeter

Perimeter is the distance around a closed 2-dimensional shape, such as rectangles, triangles, and even irregular shapes.

You can find the perimeter by adding the lengths of the sides of the shape.

Example 1.1:

Find the perimeter of the shape below.



To make sure you do not miss adding a measurement for a side

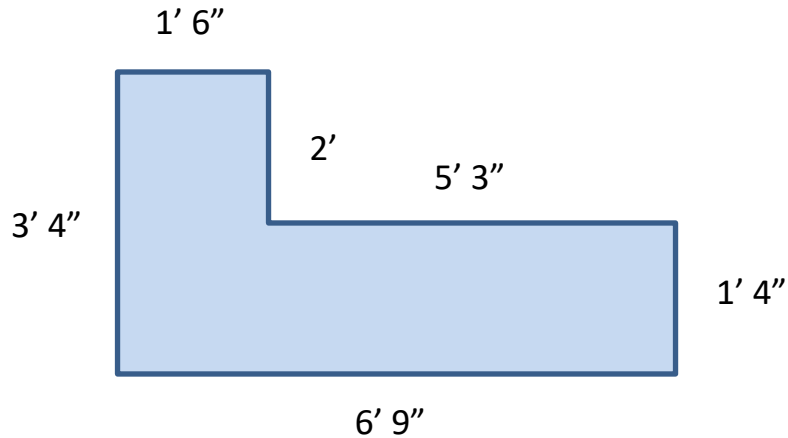
- pick a point to start on your shape
- write the measurement for that side down
- move clockwise around the shape and record the measurements for each side until you reach your starting point

$$\textit{Perimeter} = 10 \textit{ cm} + 4.5 \textit{ cm} + 10 \textit{ cm} + 4.5 \textit{ cm}$$

$$\textit{Perimeter} = 29 \textit{ cm}$$

Example 1.2:

Find the perimeter of the shape below. **Tip: 12 inches = 1 foot**



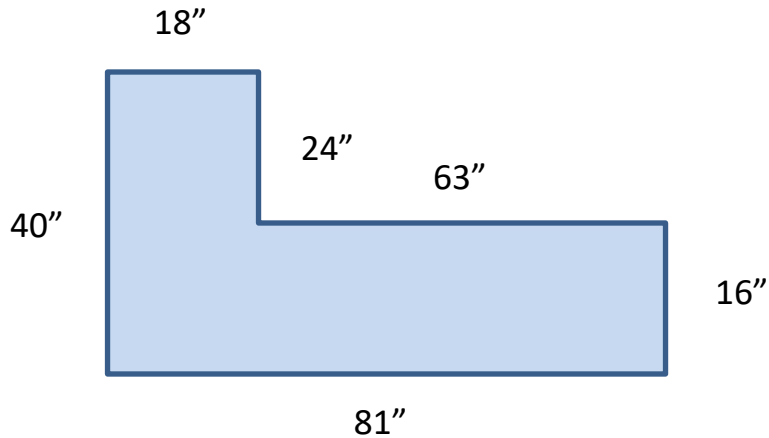
For shapes measured in feet and inches

- convert each measurement to inches
- pick a point to start on your shape
- write the measurement for that side down
- move clockwise around the shape and record the measurements for each side until you reach your starting point
- add the measurements, this is the perimeter in inches
- convert the measurement back to feet and inches (if required)

To convert to inches, remember that 1 foot = 12 inches.

$$1' 6" = \left(1' \times \frac{12''}{1'}\right) + 6'' = 12'' + 6'' = 18''$$

Try converting the rest of the measurements. The diagram below has the correct conversions.



NOTE: Please ask your instructor if you need more information on converting measurements.

We will start at the top left of the shape (18") and, moving clockwise, record each measurement.

$$\textit{Perimeter} = 18+24 + 63+16 + 81+40$$

$$\textit{Perimeter} = 242''$$

Now convert 242" back into feet and inches. First, find out how many feet are in 242".

$$242'' = (242'' \times \frac{1'}{12''}) = 20.1667'$$

There are 20 full feet and 0.1667 partial feet. Now convert the partial feet back into inches.

$$0.1667' = (0.1667' \times \frac{12''}{1'}) = 2''$$

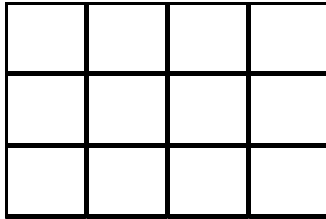
The partial feet, 0.1667', equals 2".

$$\textit{Perimeter} = 20' + 2'' = 20'2''$$

Our final answer is 20' 2".

Area of a rectangle

The area of a rectangle is the number of square units it takes to completely fill a rectangle.



This rectangle is 4 units long, 3 units wide and has an area of **12 square units** (or units²).

Units for area are always units squared!

Some common area units are

- square inches, in²
- square feet, ft²
- centimetres squared, cm²
- metres squared, m²

To find area of a rectangle you can use the formula:

Area of a rectangle = Length x Width

$$A = (L) \times (W)$$

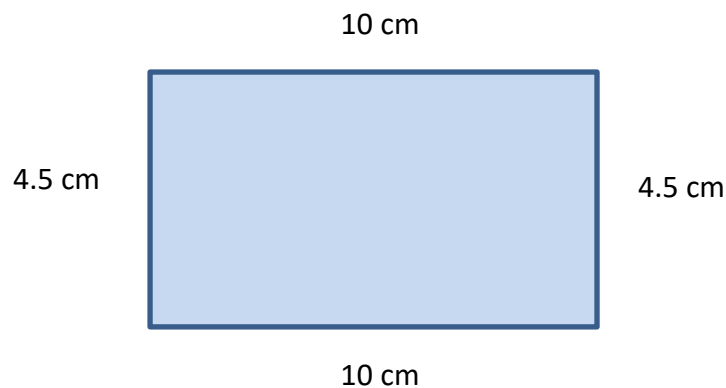
Usually, the length is the longest side, and the width would be the remaining side. However, sometimes we have a shape that requires us to divide it into multiple shapes before calculating area. In this case we would select a direction to be the length and width for the shape.

This formula works for squares too!

Note: A square is a special type of rectangle that has equal side lengths. That means that this formula works for squares too!

Example 2.1:

Find the area of the rectangle below.



First, identify the length and width.

$$\text{Length} = 10 \text{ cm}$$

$$\text{Width} = 4.5 \text{ cm}$$

Use the formula for area of a rectangle. Substitute the values for length and width to calculate the area.

$$\text{Area} = \text{Length} \times \text{Width}$$

$$\text{Area} = (10 \text{ cm}) \times (4.5 \text{ cm}) = 45 \text{ cm}^2$$

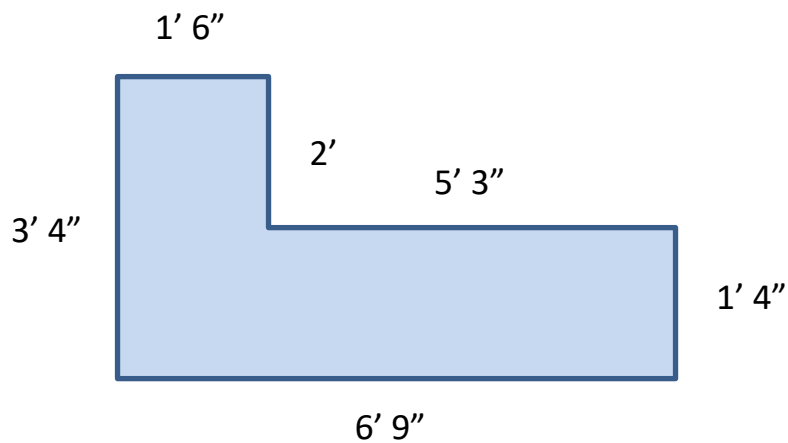
Make sure to include your units with your final answer.

NOTE: For some shapes you will need to divide the shape up into parts.

Then, you can find the area of each part separately and add the areas together to get the area of the whole shape.

Example 2.2:

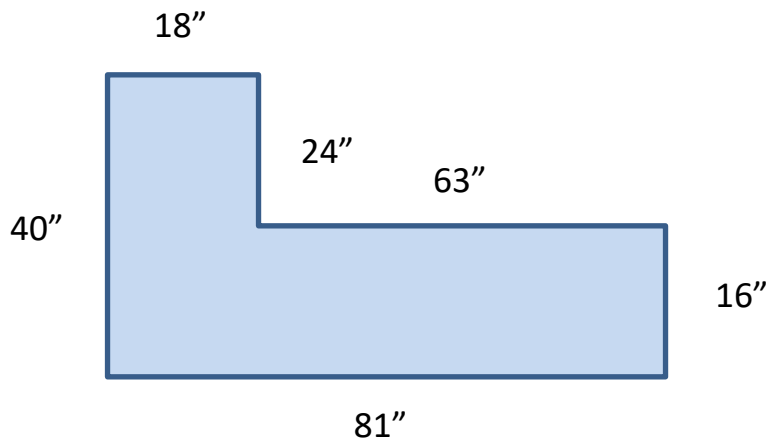
Find the area of the shape below.



Remember, first we need to convert the measurements to inches before adding, then we will convert back to feet and inches for the final answer.

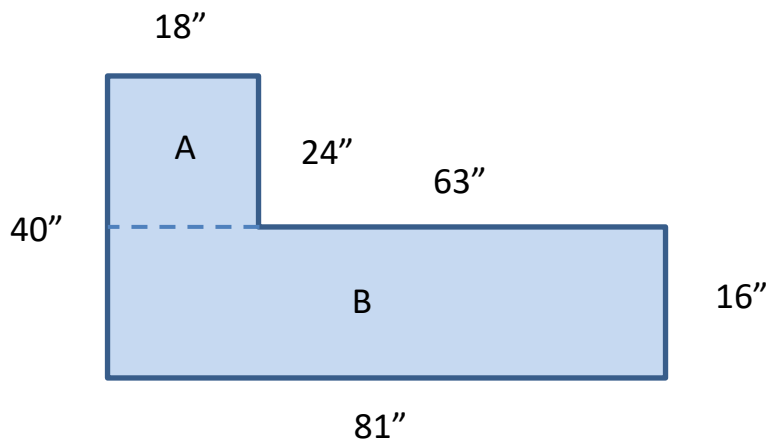
NOTE: Please ask your instructor if you need more information on converting measurements.

We will use our conversions from the perimeter example.



Notice that this shape is not a rectangle. That means we will have to look at it and divide it into rectangles so we can use the area of a rectangle formula.

We will divide this shape into two rectangles.



To find the area for the L shape, we find the area for rectangle A and rectangle B and add them together.

We will choose the horizontal direction as the width, and the vertical direction as the length.

Let's start with rectangle A and identify the length and width.

$$\text{Length} = 24''$$

$$\text{Width} = 18''$$

Use the formula for area of a rectangle. Substitute the values for length and width to calculate the area.

$$\text{Rectangle A Area} = \text{Length} \times \text{Width}$$

$$\text{Rectangle A Area} = (24'') \times (18'') = 432 \text{ in}^2$$

Now, rectangle B. Identify the length and width.

$$\text{Length} = 16''$$

$$\text{Width} = 81''$$

Use the formula for area of a rectangle. Substitute the values for length and width to calculate the area.

$$\text{Rectangle B Area} = \text{Length} \times \text{Width}$$

$$\text{Rectangle B Area} = (16'') \times (81'') = 1296 \text{ in}^2$$

To get the area of the original L-shape, we add the area of rectangle A to the area of rectangle B.

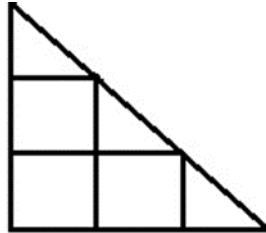
$$\text{L Shape Area} = \text{Area A} + \text{Area B}$$

$$\text{L Shape Area} = 432 \text{ in}^2 + 1296 \text{ in}^2 = 1728 \text{ in}^2$$

Again, make sure to include your units with your final answer.

Area of a triangle

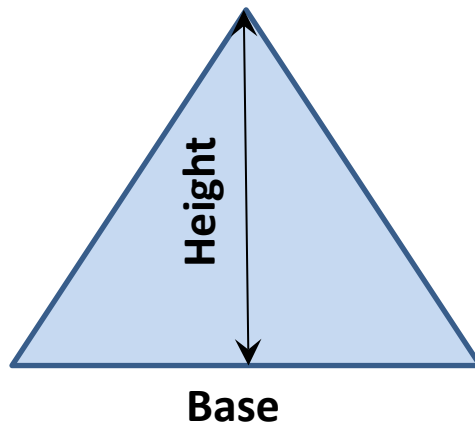
The area of a triangle is the number of square units it takes to completely fill a triangle.



The base of the triangle is 3 units long, and the height is 3 units tall. When you count the squares, you will find it has an area of 4.5 square units (or units²).

To find area of a triangle you can use the formula:

$$\text{Area of a Triangle} = (0.5) \times (\text{Base}) \times (\text{Height})$$

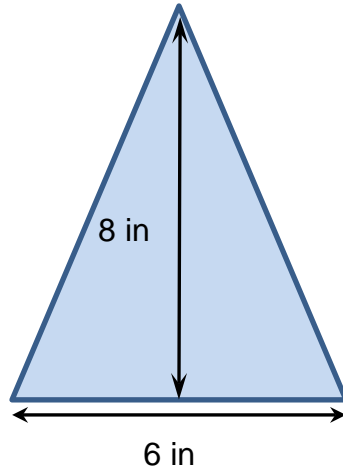


You can also write the formula this way:

$$A = \frac{1}{2} \times B \times H$$

Example 3.1:

Find the area of the triangle below.



First, identify the base and height.

$$\text{Base} = 6 \text{ in}$$

$$\text{Height} = 4.5 \text{ in}$$

Use the formula for area of a triangle. Substitute the values for base and height to calculate the area.

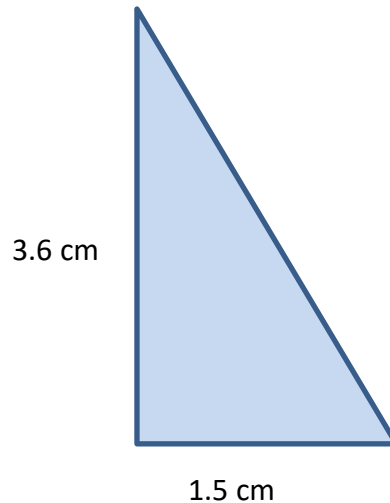
$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$\text{Area} = \frac{1}{2} \times (6 \text{ in}) \times (4.5 \text{ in}) = 13.5 \text{ in}^2$$

Make sure to include your units with your final answer.

Example 3.2:

Find the area of the triangle below.



First, identify the base and height.

$$\textit{Base} = 1.5 \textit{ cm}$$

$$\textit{Height} = 3.6 \textit{ cm}$$

Use the formula for area of a triangle. Substitute the values for base and height to calculate the area.

$$\textit{Area} = \frac{1}{2} \times \textit{Base} \times \textit{Height}$$

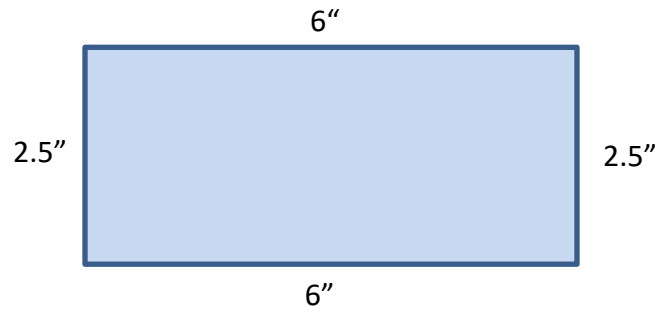
$$\textit{Area} = \frac{1}{2} \times (1.5 \textit{ cm}) \times (3.6 \textit{ cm}) = 2.7 \textit{ cm}^2$$

Make sure to include your units with your final answer.

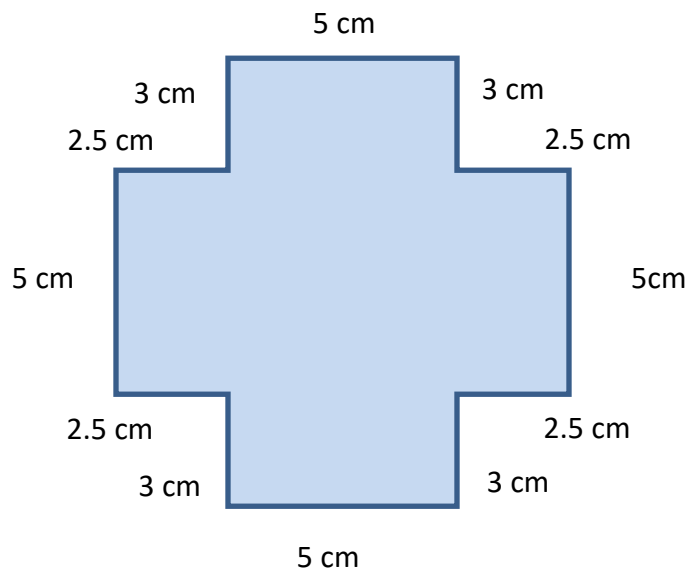
1. Find the perimeter for the following shapes.

(1 mark each)

a)



b)



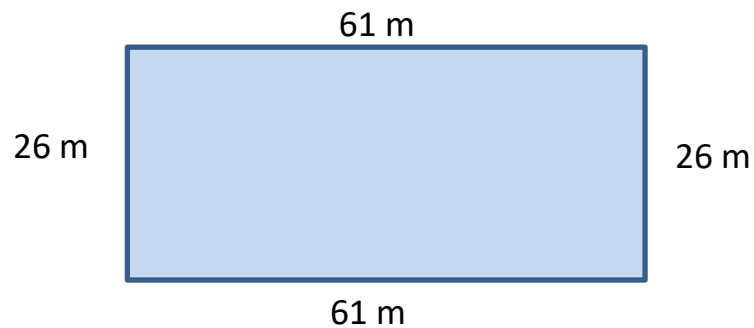
2. A rectangle has a width of 3 inches and a length of 10 inches. (7 marks)

a) Draw a sketch of the rectangle, labelling it with the length and width measurements.

b) What is the perimeter of the rectangle?

c) What is its area in square inches?

3. The drawing below is a sketch of an ice rink. (6 marks)



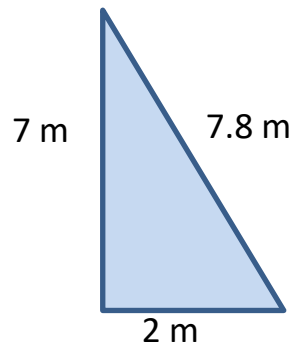
a) What is the length and the width of this rink?

b) Calculate the perimeter of the rink.

c) Calculate the area of the rink.

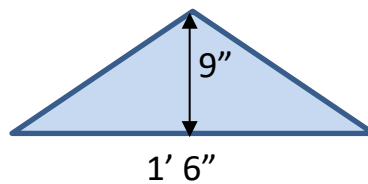
4. For the triangle show below

(6 marks)



- a) What is the base and the height of this triangle
- b) Calculate the perimeter of the triangle.
- c) Calculate the area of the triangle.

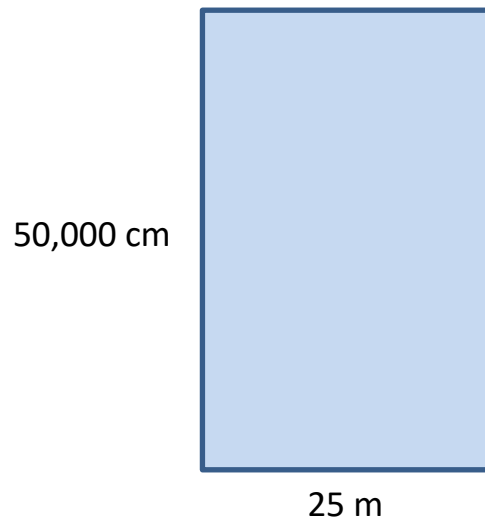
5. For the triangle show below (5 marks)



- a) What is the base and the height of this triangle
- b) Calculate the area of the triangle. Answer in square inches.

(Tip: 1 foot = 12 inches)

6. The drawing below is a sketch of an Olympic sized swimming pool. (8 marks)



- a) What is the length and the width of this Olympic pool?
 - b) Calculate the perimeter of the pool. (**Tip; 100 cm = 1 m**)
 - c) Calculate the area of the pool. Answer in square metres.
7. You want to build a rectangular dog run in the back yard, with a fence around the outside of the dog run. It will measure 12 m by 5.5 m. (7 marks)
- a) Draw a sketch of the dog run, labelling the length and width with the measurements.

- b) How many metres of fencing will you need to build the dog run?
- c) How many square metres of sod will you need to buy to sod the dog run?
8. The south end of your roof is triangular with a base of 9.25 m and is 3.5 m high. What is the area of that roof surface? Answer in m^2 . (3 marks)

Bibliography

All materials created by S. Hicks and L. Roque, Fleming College, 2023

1. (1 mark each)
 - a) 17"
 - b) 42 cm

2. (7 marks)
 - a) Sketch may vary. (3 marks; 1 for rectangle, 1 each for correct label, -0.5 each for missing units)
 - b) 26 inches (2 marks; -0.5 for missing units)
 - c) 30 square inches (2 marks; -0.5 for missing units)

3. . (6 marks)
 - a) Length = 61 m and width = 26m (1 mark each; -0.5 each for missing units)
 - b) 174 m (2 marks; -0.5 for missing units)
 - c) 1586 m² (2 marks; -0.5 for missing units)

4. (6 marks)
 - a) Base = 2 m and height = 7 m (1 mark each; -0.5 each for missing units)
 - b) 16.8 m (2 marks; -0.5 for missing units)
 - c) 7 m² (2 marks; -0.5 for missing units)

5. (5 marks)
 - a) Base = 1'6" or 18" and height = 9" (1 mark each; -0.5 each for missing units)
 - b) 81 in² (3 marks; 1 for correct conversion, 2 for calculation, -0.5 for missing units)

6. (8 marks)

- a) Length = 50,000 cm or 500 m and width = 25 m (1 mark each; -0.5 marks for missing units)
- b) 1050 m or 105,000 cm (3 marks; 1 for correct conversion, 2 for calculation, -0.5 for missing units)
- c) 12,500 m² (3 marks; 1 for correct conversion, 2 for calculation, -0.5 for missing units)

7. (7 marks)

- a) Draw a sketch of the dog run, labelling the length and width with the measurements. (3 marks; 1 for rectangle, 1 each for correct label, -0.5 each for missing units)
- b) 35 m (2 marks; -0.5 for missing units)
- c) 66 m² (2 marks; -0.5 for missing units)

8. 16.1875 m² (3 marks; 1 mark each for base and height ID, 2 marks for calculations, -0.5 for missing units)