

Nelson Maths 9 for the CSF II

Homework and Assessment Sheets

Use and convert units of measurement

ME 9-1

Name: _____ Class: _____

Due date: _____ Parent's signature: _____

Level 5										/20	Level 6										/10

Part A: Level 5

Supply the multiplication or division factor in these metric conversions.

For example: 15 cm $\times 10$ = 150 mm

1 5.2 m _____ = _____ mm

2 250 g _____ = _____ kg

3 6 349 000 mm _____ = _____ km

Convert each time measurement into the units indicated in the brackets.

4 $3\frac{1}{4}$ h (min) _____

5 1.95 h (s) _____

Match the speeds with the units.

6 0.5 mL/min kangaroo being chased _____

7 1 km/s bullet in flight _____

8 50 mL/s running water _____

9 40 km/h dripping water _____

The cube in the diagram represents 1 L.

10 How many cubic cm is this? _____

11 How many cubic mm is this? _____

12 Write the correct symbol for these units.

cubic m _____ cubic mm _____ cubic cm _____

13 How many hours will there be in the year 2000? _____

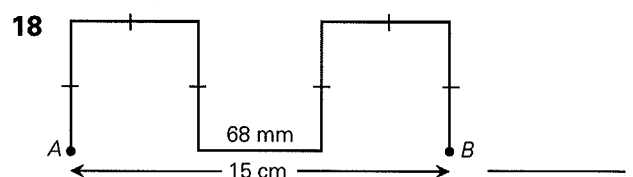
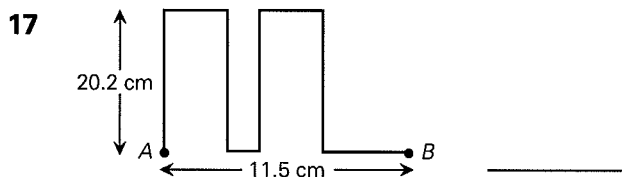
When Louis prepared dinner, he spent $\frac{1}{12}$ hour setting the table, $\frac{1}{4}$ hour preparing to cook, 50 minutes cooking and 0.1 hour serving the meal.

14 How long did the whole task take in minutes? _____

15 What fraction of an hour did he spend setting the table and preparing? _____

16 How many seconds did he take to serve the meal? _____

In each case, find the distance travelled from A to B in cm (all angles are 90°).



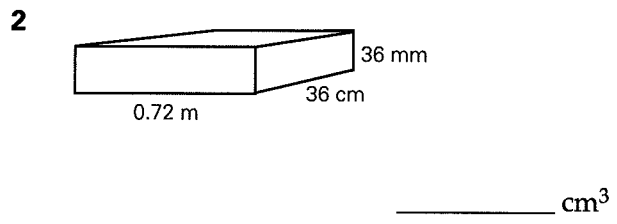
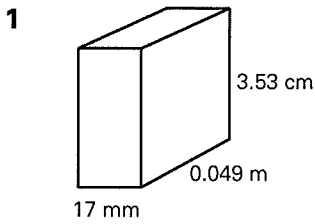
Students on a hike travelled 18 km in $3\frac{1}{2}$ h on their first day but 28 km in $4\frac{1}{2}$ h the next.

19 On which day did they travel fastest? _____ What was the speed in km/h? _____

20 How far in km would they expect to travel in 7 hours at the first day's speed? _____

Part B: Level 6

Calculate each volume and write the answer in the units specified.



Answer the following questions, giving the correct units.

- 3 What is the concentration of 5 g of sugar in a 250 mL cup of tea? _____
- 4 What is the density of a 350 g rock which displaces 800 mL of water from a fish tank? _____

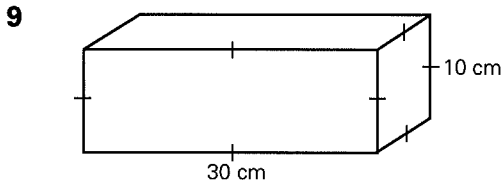
Distances beyond our solar system are measured in light years.

- 5 If the speed of light is 300 000 km/s, how 'far' is a light year in km (standard form)? _____

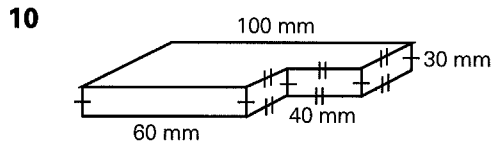
Now complete the table about light years.

	'Star'	Light years from Earth	Distance in km (standard form)
6	Crab Nebula	6000	
7	Capella	45	
8	α -Centauri	4.2	

There are two correct answers to each of the following volumes; circle them.



$3 \times 10^3 \text{ mm}^3$ or 3000 cm^3 or 3.0 L



$1.92 \times 10^5 \text{ mm}^3$ or 19.2 cm^3 or 0.192 L

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A 1-metre-wide path runs around the edge of a rectangular lawn 25 m long and 15 m wide.

How far will you have walked if you travel once around the path, keeping to the centre?

Hint: Draw a diagram.

Vocabulary

Write the mathematical meanings of:

- Metric units _____
- Speed _____
- A light year _____
- Concentration _____
- Density _____

Nelson Maths 9 for the CSF II Homework and Assessment Sheets

Perimeter and scale

ME 9-2

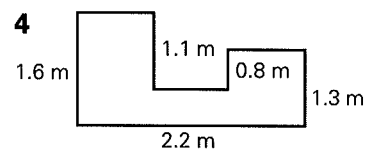
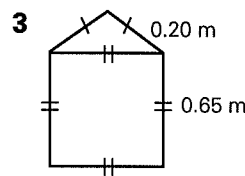
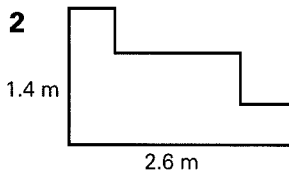
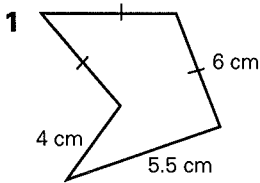
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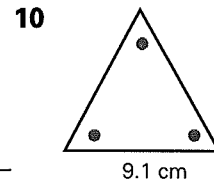
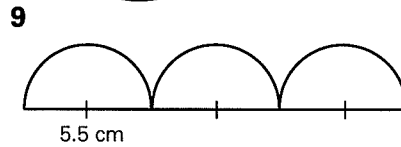
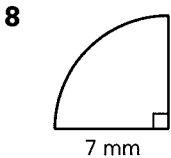
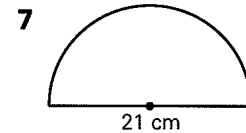
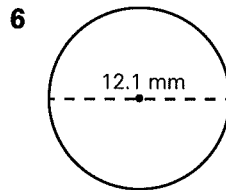
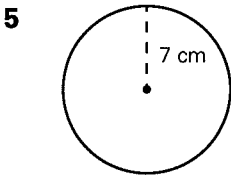
Level 5										/20	Level 6										/10

Part A: Level 5

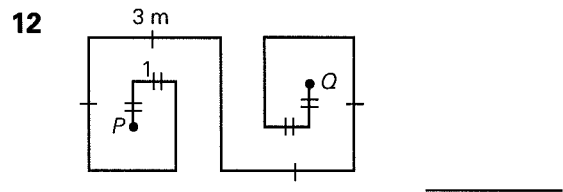
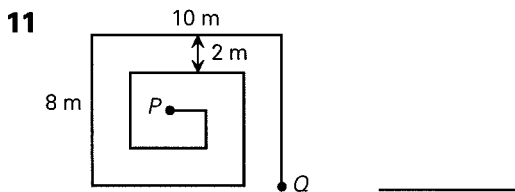
Find the perimeter of each shape and answer in the units indicated.



Calculate the perimeter of each shape in centimetres, correct to one decimal place.



Find the length of the line connecting P and Q in each case.

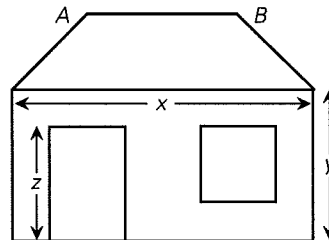


If the line AB represents 1 m, estimate the value of the lengths labelled x , y and z (in metres).

13 $x =$ _____

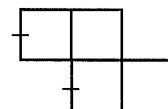
14 $y =$ _____

15 $z =$ _____



16 Farmer Brown needed exactly 1.44 km of fencing to enclose a new square paddock. How long was each side in m? _____

17 His neighbour, Farmer Green, had four square paddocks as shown. If he needed 1.82 km of fencing to replace all existing fences, how long is each paddock in m? _____



Insert the correct sign ($=$, $<$ or $>$) to make each statement correct.

- 18 The perimeter of a square of length 5 cm _____ the circumference of a circle with radius 3 cm.
- 19 The perimeter of an equilateral triangle with side 10 cm _____ the circumference of a circle with diameter 10 cm.
- 20 The circumference of a circle with radius 0.1 m _____ the perimeter of a square with length 0.16 m.

Part B: Level 6

Each diagram shows a large and small replica of a particular shape. How much longer is the large perimeter than the small one in each case?

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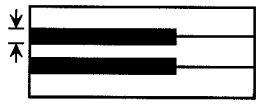
Find the perimeter of each figure correct to two decimal places.

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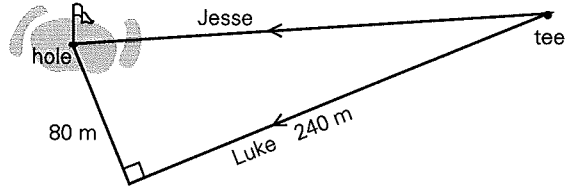
The piano keys are drawn to a scale factor 1 : 5. Give the following actual dimensions.

- 6 The length of a white note. _____
- 7 The width of a black note. _____



These questions refer to the scale drawing of a section of golf course. Jesse scored a hole in one but Luke needed two shots to complete the hole.

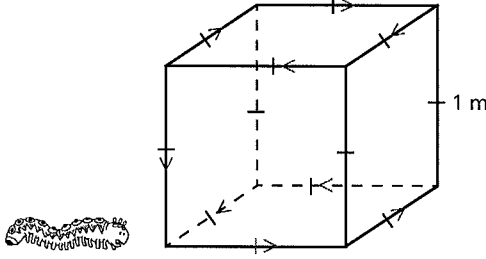
- 8 How far did Jesse's ball travel? _____
- 9 How much further did Luke's go? _____



- 10 What scale factor has been used in this drawing? _____

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What is the longest distance the caterpillar can crawl along the wire frame without travelling any wire more than once?



Vocabulary

Write the mathematical meaning of:

Perimeter _____

Circumference _____

Dimensions _____

Scale factor _____

Nelson Maths 9 for the CSF II

Homework and Assessment Sheets

Area and surface area

ME 9-3

Name: _____ Class: _____

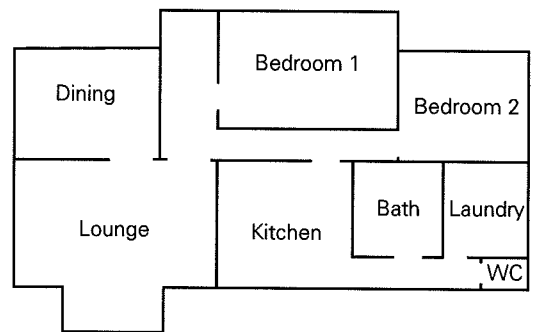
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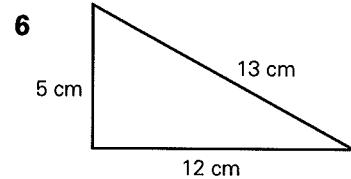
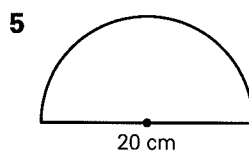
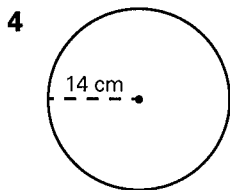
Part A: Level 5

The house plan on the right has a kitchen area of 10 m^2 . Estimate by eye the area of:

- the bathroom _____ m^2
- the lounge _____ m^2
- the WC _____ m^2

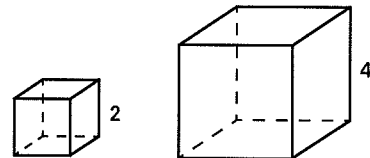


Calculate the area of each figure in cm^2 .



Find the surface area of each cube and express your answer as:

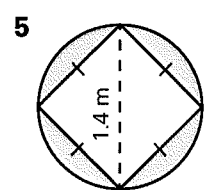
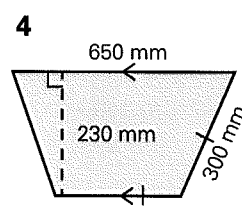
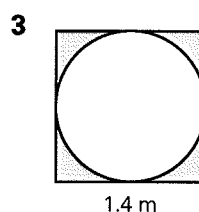
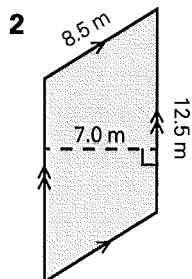
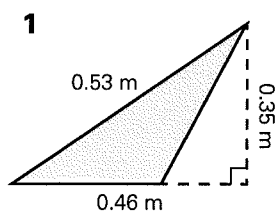
- the ratio smallest : largest _____
- the ratio in simplest form _____



- A packet of lawn seed has a mass of 2.5 kg and should be sufficient for sowing 8 m^2 . How many kg per square metre is this? _____
- A gardener spent $1\frac{1}{2}$ hours before lunch and $1\frac{1}{4}$ hours after lunch weeding a 13 m by 7.5 m rectangular garden plot. What was his average weeding rate? _____ m^2/h

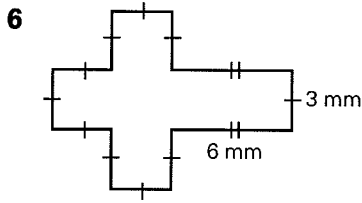
Part B: Level 6

Calculate each shaded area in m^2 .

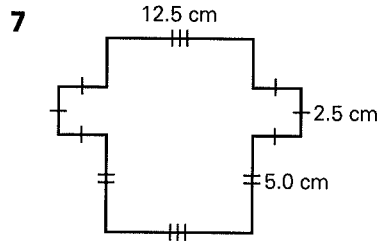


Hint: Use Pythagoras' rule.

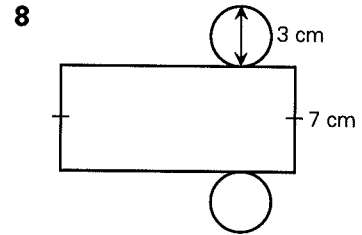
These diagrams are nets. Name the prism constructed from the net and calculate its surface area.



Name _____
Surface area _____



Name _____
Surface area _____



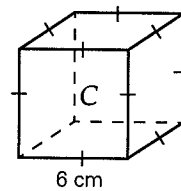
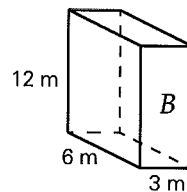
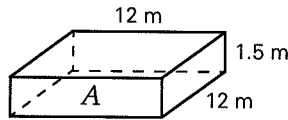
Name _____
Surface area _____

9 and 10 Express the area of a hectare in m^2 _____ and in km^2 . _____

11 If a hectare of land is rectangular and 75 m along one side, what is the length of the other side? _____

12 to 14 What are the surface areas of prisms A, B and C?

A = _____
B = _____
C = _____



15 What is the simplest ratio of surface area A : B : C? _____ : _____ : _____

A farmer has 100 m of fencing available to fence a rectangular paddock. His wife said the maximum area that could be enclosed was when the paddock was square.

16 Explain. _____

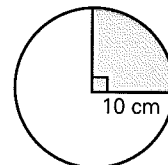
17 If a straight creek can be used for one boundary, what are the three side lengths? _____

18 What is the maximum area he can now enclose? _____

The shaded area of the circle is cut out and made into a cone.

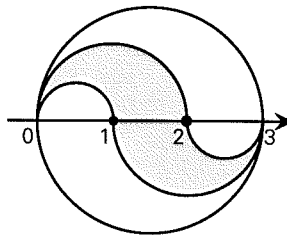
19 What is the slant height? _____

20 What is the circumference of its base? _____



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Show that the shaded area of the figure on the right is $\frac{3}{4}\pi$.



Vocabulary

Write the mathematical meanings of:

Surface area _____

Parallelogram _____

Trapezium _____

Net _____

Prism _____

Cone _____

Nelson Maths 9 for the CSF II

Homework and Assessment Sheets

Volume and capacity

ME 9-4

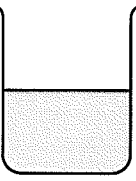

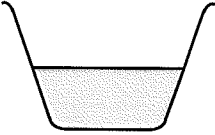
Name: _____ Class: _____

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Level 5					/10					Level 6					/20									

Part A: Level 5

Complete the table below by estimation.

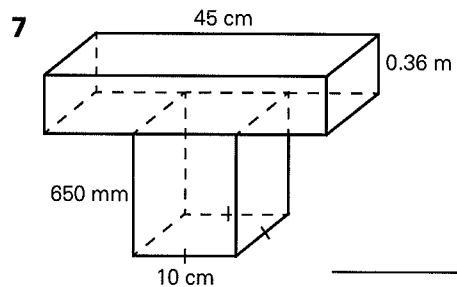
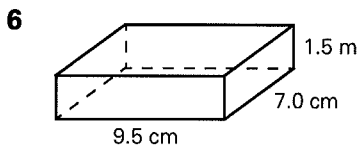
Container	1	2	3
			
Capacity	2 L	mL	mL
Volume of liquid	L	150 mL	40 mL

Put these volumes in increasing order.

4 2.5 L 250 mL 25 cm³ _____

5 100 cm³ 1.0 m³ 10 dm³ _____

Calculate the volumes of these prisms in cm³.

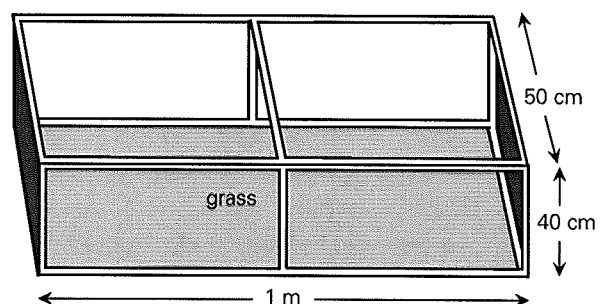


The diagram is the wooden frame of a guinea pig hutch with plastic sheeting at the ends and chicken wire on the other sides and top. The bottom is open so the guinea pigs are on the grass.

8 How many metres of wood are needed for the frame? _____

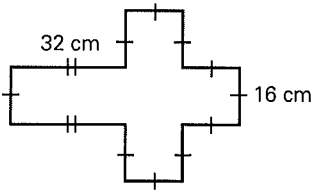
9 How many square metres of plastic sheeting are needed for the ends? _____

10 How much chicken wire is needed for the top and sides? _____

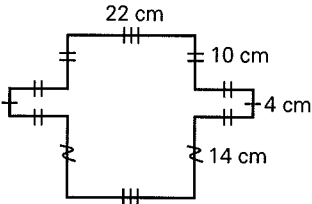


Part B: Level 6

Each net can be folded to make a rectangular prism. Answer the questions below each diagram.

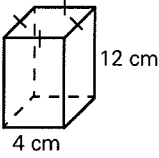
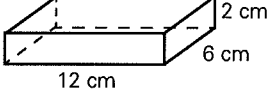
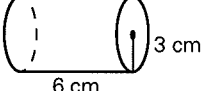
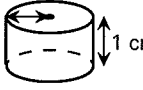


- 1 surface area = _____
- 2 prism l, w, h = _____
- 3 volume in L = _____

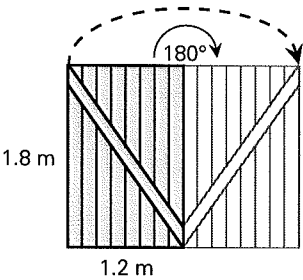


- 4 surface area = _____
- 5 prism l, w, h = _____
- 6 volume in L = _____

Calculate the surface area and volume of each solid and complete the table.

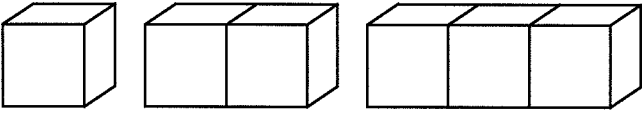
Prism	Surface area	Volume	SA : V
	7	8	9
	10	11	12
	13	14	15
	16	17	18

- 19 If a $1.8\text{ m} \times 1.2\text{ m}$ gate swings open through a 180° arc, what volume of air is displaced? _____
- 20 Would you expect a $1.2\text{ m} \times 1.8\text{ m}$ gate to displace the same amount of air? Why? _____



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Below is a pattern generated by adding successive cubes of side 1 cm.



Find a relationship between the number of blocks (n), volume (V) and total surface area (A).

Vocabulary

Write the mathematical meanings of:

- Volume _____
- Capacity _____
- Arc _____