Striving To Improve

PHOTOCOPY MASTERS

Angles, Shapes And Mensuration

For students aged 11 - 15 years who are underachieving at their year level.

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Ready-Ed Publications

Teachers' Notes

This resource is focused on the Measurement and Geometry areas of the Mathematics Curriculum. It is intended for lower ability students and those who need further opportunity to consolidate these core areas in Mathematics. Each section provides students with the opportunity to consolidate written and mental methods of calculation, with an emphasis on process and understanding.

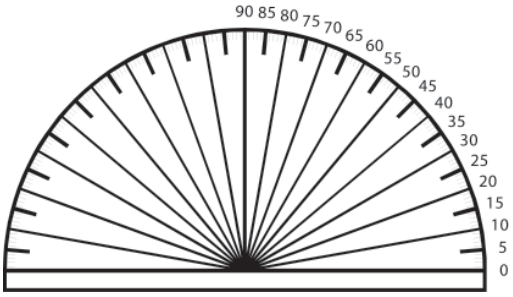
The section entitled *Angles* enables students to review types of angles and naming angles. There is the opportunity to practise drawing angles and using angles within a context. Students then have the opportunity to investigate angles in a triangle and to also classify the different types of triangles. These activities are a useful way to scaffold a new unit of Mathematics and will help build confidence for lower ability students to attempt more challenging problems at their year level.

The section entitled *Shapes And Mensuration* familiarises students with units of length, mass and capacity and provides activities to consolidate unit conversions using mental strategies. The activities then move on to exploring perimeter and area of rectangles and triangles and allow for a thorough consolidation of these foundational concepts. Students then engage with simple volume and capacity ideas.

The activities can be used for individual students needing further consolidation in a mainstream classroom or as instructional worksheets for a whole class of lower ability students. The activities range from grade levels of Year 4 through to Year 7 and are appropriate for students requiring extra support in Years 7, 8 and 9.

It is hoped that *Angles, Shapes And Mensuration* will be used to help teachers provide appropriate resources and support to those students in greatest need. The book as a whole can be used as a programme of work for those students on a Modified Course or Independent Learning Programme. Activities are sufficiently guided so that students can work independently and at their own pace without constant supervision and guidance from the teacher.

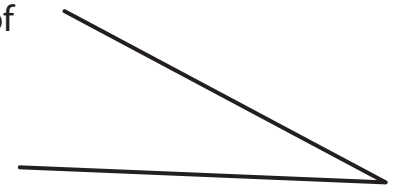
❂ Measuring Angles 1



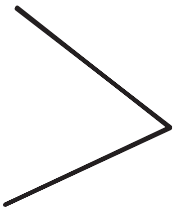
- Angles are measured in degrees. This is usually expressed with this symbol °. A protractor is used to measure angles. Using a protractor follow the example below and then complete the activities.

How To measure an angle.

1. Place the centre of the protractor on the corner or sharpest point (vertex) of the angle.
2. Turn the protractor so that the base line runs along one of the lines that forms the angle.
3. You can then read the size of the angle from the position of the second line.
   For example this angle is approximately _____°
4. Most protractors number the angles both clockwise and anti-clockwise. Make sure that you start at 0 and follow the correct set of numbers.



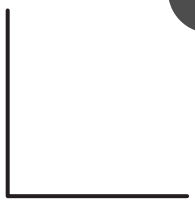
✳ TASK A **Measure the angles below and write down the type of angle for each one, e.g. acute, obtuse or right.**



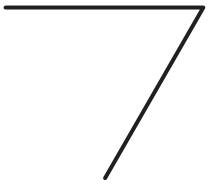
1. size:. . . . . type: . . . . . .

2. size:. . . . . type: . . . . . .

3. size:. . . . . type: . . . . . .



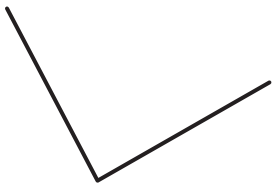
4. size:. . . . . type: . . . . . .



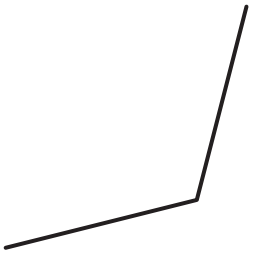
5. size:. . . . . type: . . . . . .

6. size:. . . . . type: . . . . . .

7. size:. . . . . type: . . . . . .



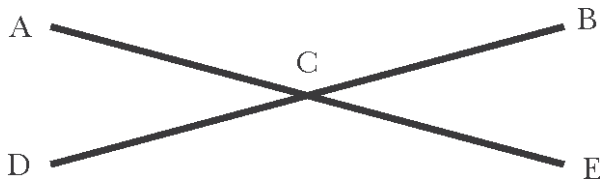
8. size:. . . . . type: . . . . . .



9. size:. . . . . type: . . . . . .

❂ Intersecting Lines

✳ TASK A **Measure the angles in the diagram below.**



∠ACD = ... ∠BCE = ...

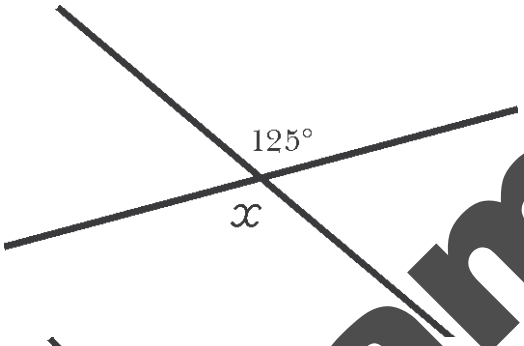
∠DCE = ... ∠ACB = ...

Complete this sentence to make up a new rule.

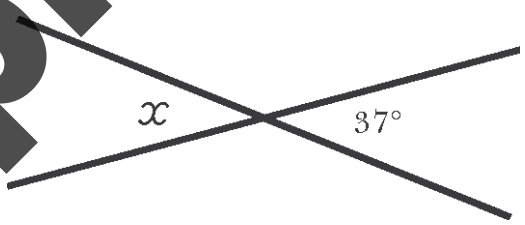
When two straight lines intersect _____ .

✳ TASK B **Use this rule to find the size of angle x below.**

1.



2.



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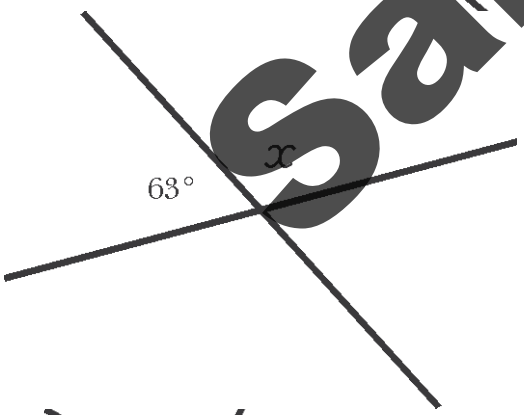
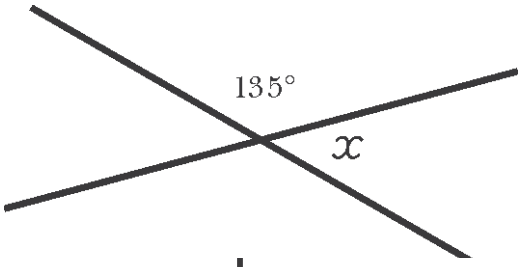
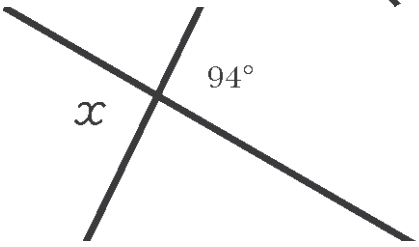


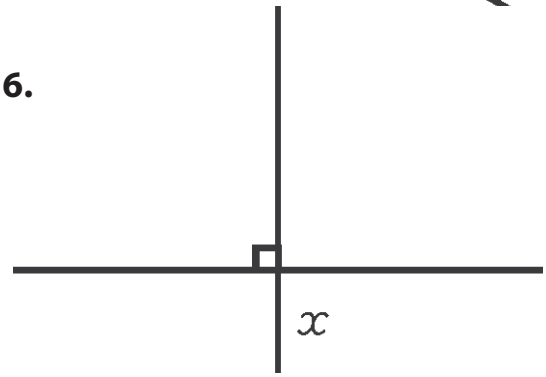
4.



5.



6.



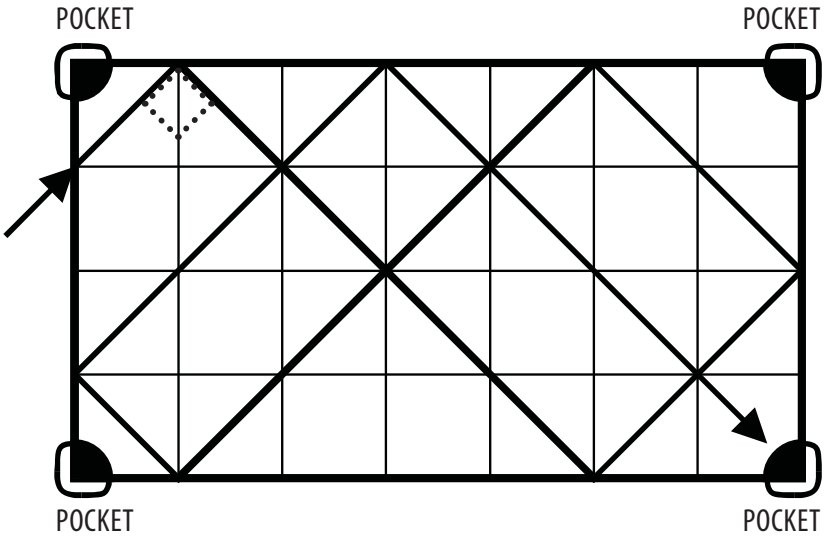
x =

1. ..... 2. ..... 3. ..... 4. ..... 5. ..... 6. .....

TASK C: CHALLENGE - Find the values of all the other angles in each diagram above and write them in. Remember the rule: Angles along a straight line add up to 180°.

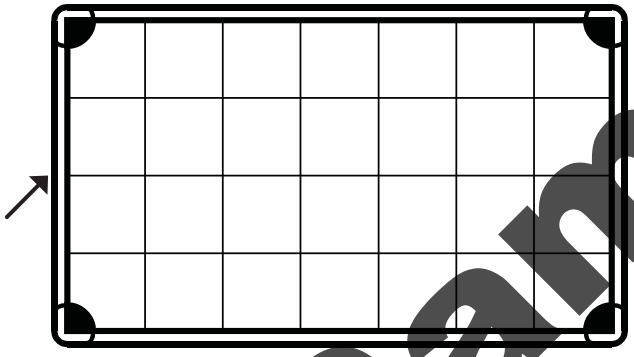
Snooker Angles

- Here is a diagram of a snooker table with only four pockets. The way in which it works is very simple. If you hit the ball it then bounces off the side cushion at a 90° angle until it finally lands in a pocket. In the example right, the track of the ball is mapped out for you.

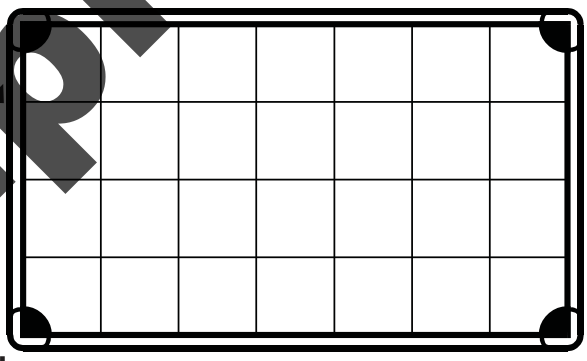


TASK A **Using this method, work out which pocket each of the following balls will go into if they are hit in the direction of the arrow. Draw a circle around the pocket.**

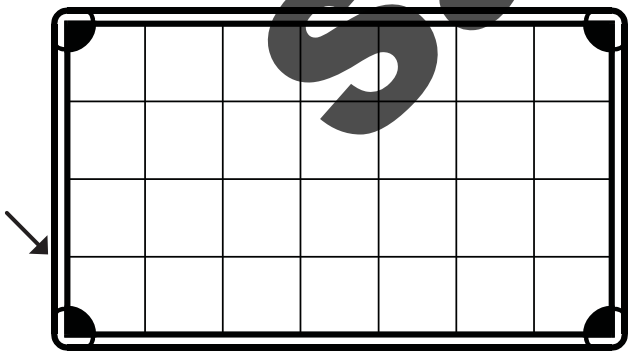
a.



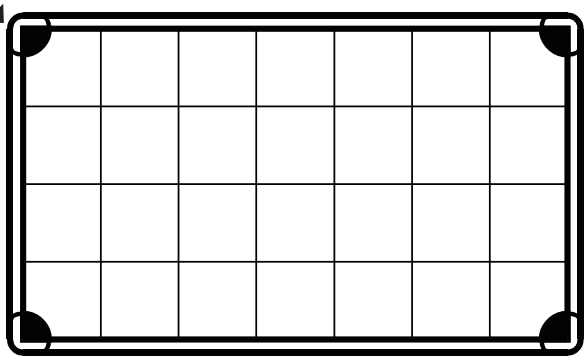
b.



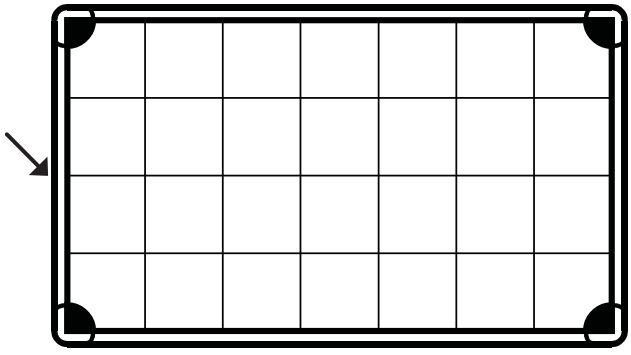
c.



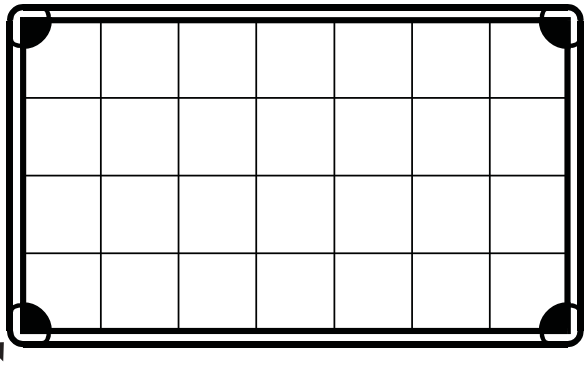
d.



e.



f.

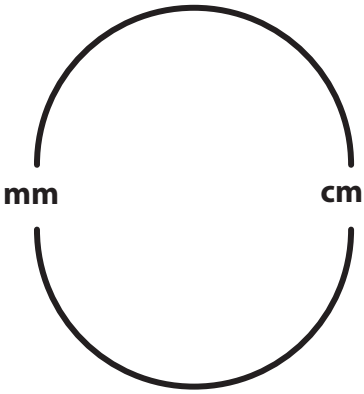


❂ Length Conversions 1

✱ TASK A Converting millimetres to centimetres

To convert mm to cm we divide by 10.
Write this in symbols on the diagram right.

To convert cm to mm we multiply by 10.
Write this in symbols on the diagram right.



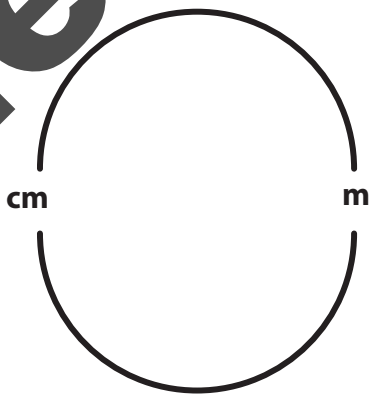
Convert each of the following.

a) 1 cm = _____mm	b) 50 mm = _____ cm	c) 35 mm = _____cm
d) 20 cm = _____ mm	e) 7.2 cm = _____ mm	f) 4 mm = _____cm

✱ TASK B Converting centimetres to metres

To convert cm to m we divide by 100.
Write this in symbols on the diagram right.

To convert m to cm we multiply by 100.
Write this in symbols on the diagram right.



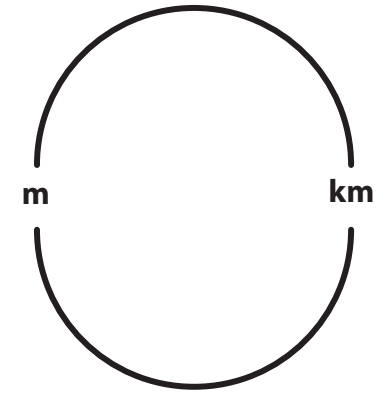
Convert each of the following.

a) 5 m = _____cm	b) 200 cm = _____m	c) 42 m = _____cm
d) 351 m = _____cm	e) 527 cm = _____m	f) 32 cm = _____m

✱ TASK C Converting metres to kilometres

To convert m to km we divide by 1000.
Write this in symbols on the diagram right.

To convert km to m we multiply by 1000.
Write this in symbols on the diagram right.



Convert each of the following.

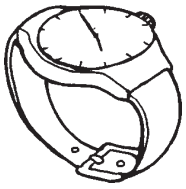
a) 3 km = _____m	b) 2000 m = _____km	c) 4.3 km = _____m
d) 355 m = _____km	e) 12 m = _____km	f) 215 km = _____m

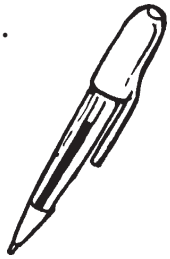
Units Of Mass 1

- Here are some things that can measure 1kg (1 kilogram).

There are 1000 g (grams) in 1kg.

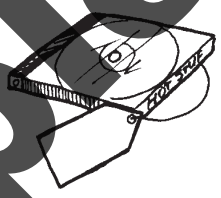
- Here are some things that can measure less than 1kg.





✱ TASK A **Circle whether you would measure these things in grams or kilograms.**

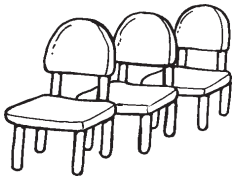
grams kilograms



grams kilograms

grams kilograms

grams kilograms



grams kilograms

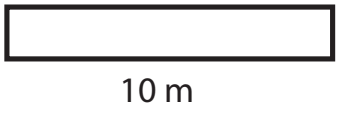
✱ TASK B **Find some things in the home (try the kitchen or laundry) that have a label showing how much they weigh. Draw them here and circle whether they are in grams (g) or kilograms (kg).**

=_____ g / kg	=_____ g / kg	=_____ g / kg	=_____ g / kg

❂ Areas Of Rectangles 1

✳ TASK A **Calculate the area of the following rectangles using Area = Length x Width.**

a)

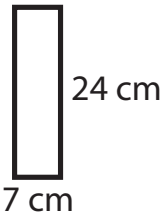


.....

b)

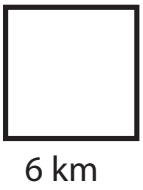
.....

c)



.....

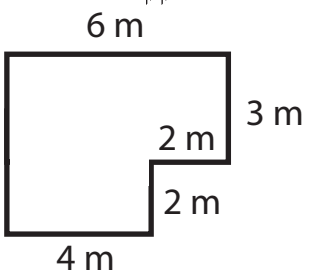
d)

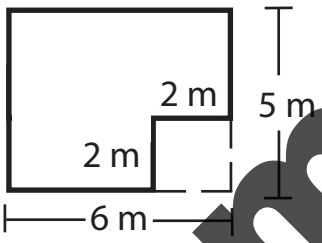


.....

Look at the two methods below. Total area is calculated by working out the area of the rectangles that fit into the polygon.

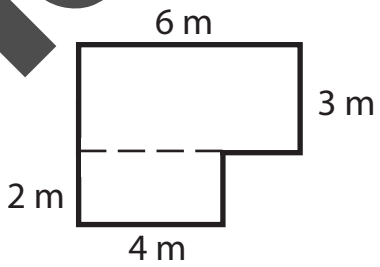
Method 1 **Subtraction**





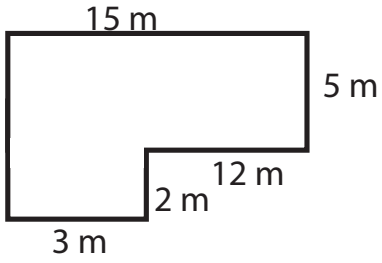
Area of large rectangle
= l x w = 6 x 5 = 30 m²
Area of small rectangle
= l x w = 2 x 2 = 4 m²
Total area = 30 - 4 = 26 m²

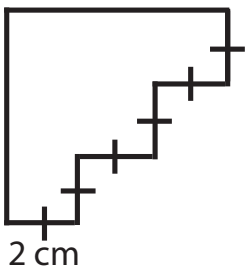
Method 2 **Addition**

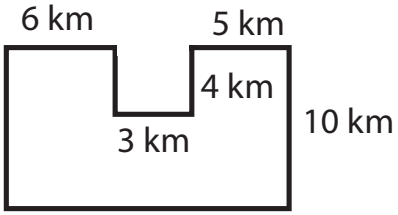


Area of large rectangle
= l x w = 6 x 3 = 18 m²
Area of small rectangle
= l x w = 2 x 4 = 8 m²
Total area = 18 + 8 = 26 m²

✳ TASK B **Use one of the methods to find the area of these shapes.**







a) ..... b)..... c).....