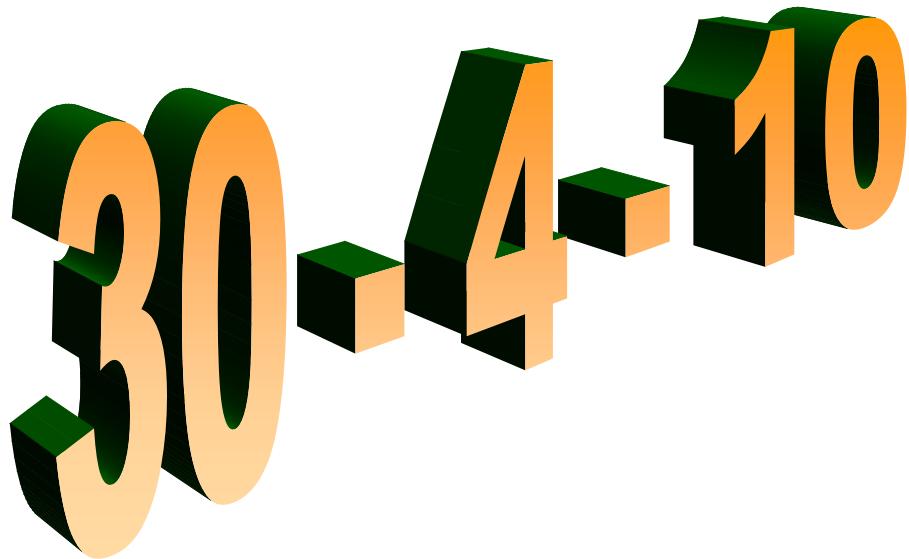


# Maths

30 · 4 · 10



# Revision



The idea of 30-4-10 is for you to spend 30mins each day for 10 days revising mathematics. The starter questions should last about 10mins and the topic questions 20mins. The 'Hints and Tips' are there to help you with each section – you could also use your maths revision guides, text books, your exercise books or various websites.

Answers are available at the bottom of the front page of [stpaulsmaths.com](http://stpaulsmaths.com) or by scanning this QR code...



Remember to make a list of the questions that you are still finding difficult to ask your maths teacher about.

***Good Luck!***

# DAY 1

1. Simplify  $2x + 3y + 5x - 2y - 4x$

.....

Answer .....

2. Multiply out  $4(m - 1)$

.....

Answer .....

3. Tara buys  $x$  rulers at 25 pence each and  $y$  biros at 70 pence each.

Write down an expression for the total cost of the rulers and biros.

.....

Answer ..... pence

4. Factorise  $x^2 + 5x$

.....

Answer .....

5. Solve the equation  $\frac{x}{4} = 8$

4

.....

Answer .....

6.. Write down the value of the following:

(a)  $13^2 = \dots$

(b)  $\sqrt[3]{8} = \dots$

(c)  $2^5 = \dots$

(d)  $(-4)^2 = \dots$

(e)  $\sqrt{64} = \dots$

(f)  $\sqrt[3]{64} = \dots$

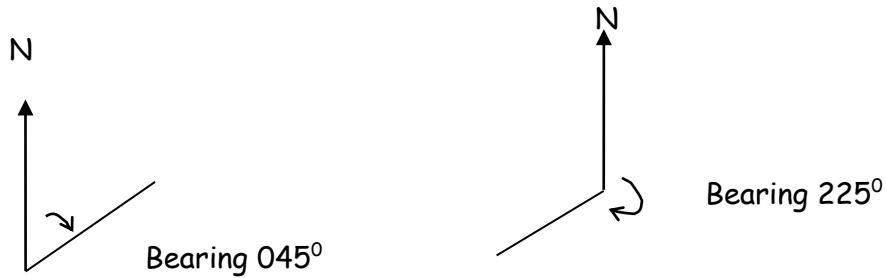
## Hints and Tips

## Bearings

Read the question carefully before you start.

You need a **Pencil**, **Ruler** and **Protractor** for this topic.

- Measure lines to  $\pm 1\text{mm}$ .
- Measure angles to  $\pm 2^\circ$
- Remember that Bearings are always measured from North.



- Always measure clockwise.
- Always use three figures e.g.  $035^\circ$  or  $156^\circ$
- Remember that your North line should be drawn at the point where the bearing is taken from e.g. Find the bearing of A from B - draw the North line at B

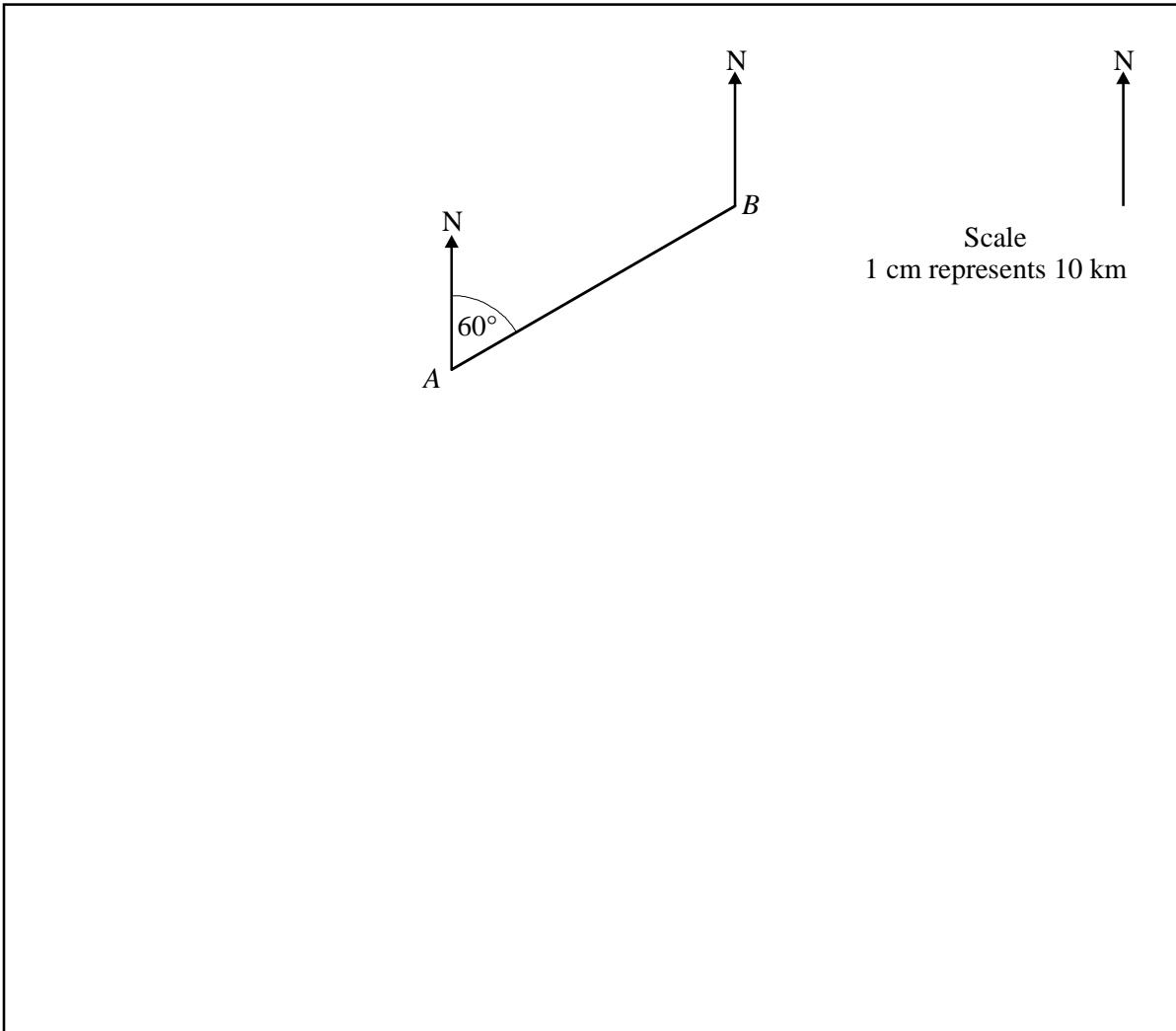


# Bearings

1. The diagram shows the positions of  $A$  and  $B$ .

The diagram is drawn to scale.

1 cm represents 10 km.



(a) Use the diagram to calculate the actual distance of  $B$  from  $A$ .

.....  
.....

Answer ..... km (2)

(b)  $C$  is due south of  $B$ .

(i) Write down the three figure bearing of  $C$  from  $B$ .

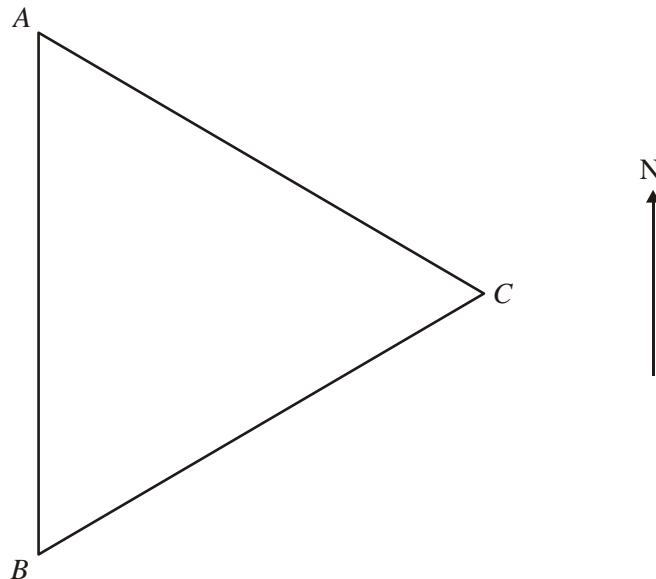
Answer .....  $^{\circ}$  (1)

(ii)  $C$  is also on a bearing of  $150^{\circ}$  from  $A$ .

Mark the position of  $C$  on the diagram. (2)



2. (a)  $A$ ,  $B$  and  $C$  are three towns which form an equilateral triangle as shown.



Use the given bearings to complete the sentences.

$060^\circ$   $120^\circ$   $180^\circ$   $240^\circ$   $300^\circ$

(i)  $C$  is on a bearing of ..... from  $A$ . (1)  
(ii)  $B$  is on a bearing of ..... from  $C$ . (1)

(b)  $D$ ,  $E$  and  $F$  are three towns.  
 $E$  and  $F$  are shown on the diagram.  
 $D$  is on a bearing of  $070^\circ$  from  $E$ .  
 $D$  is also on a bearing of  $320^\circ$  from  $F$ .

Complete the diagram to show accurately the position of  $D$ .

N



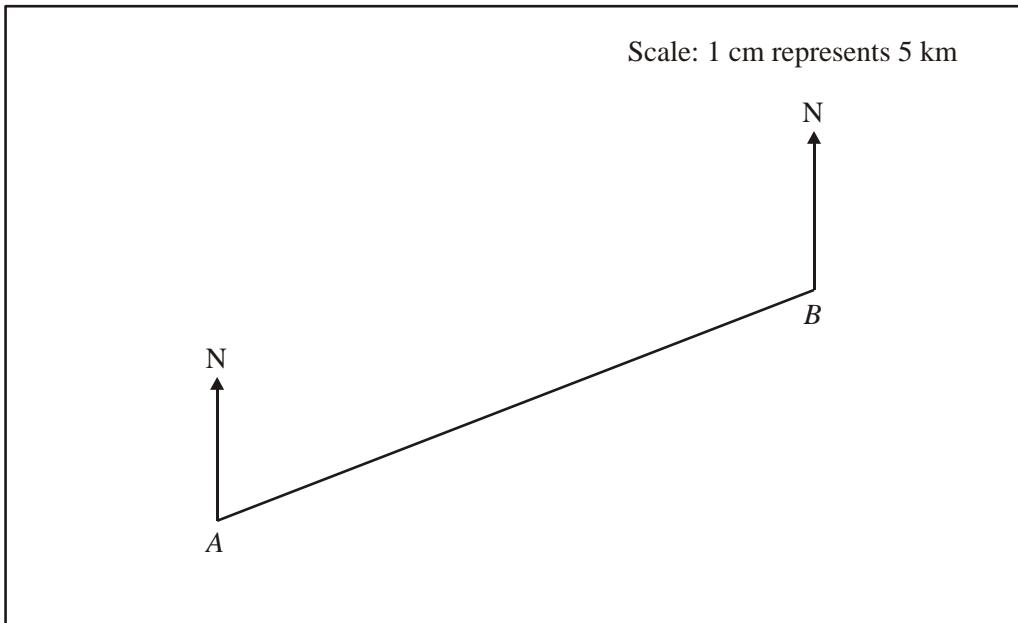
N



(2)



3. The diagram shows the position of two towns  $A$  and  $B$ .



(a) Measure the length of  $AB$  in centimetres.

Answer ..... cm (1)

(b) Use the scale to work out the actual distance between the towns  $A$  and  $B$ .  
Give your answer in kilometres.

..... km (2)

(c) Measure and write down the three-figure bearing of  $B$  from  $A$ .

Answer ..... ° (1)

(d)  $C$  is due east of  $A$  and due south of  $B$ .

Mark the position of  $C$  on the diagram.

(2)  
(Total 15 marks)

## DAY 2

1. Multiply out  $p(p + 3)$

.....  
.....

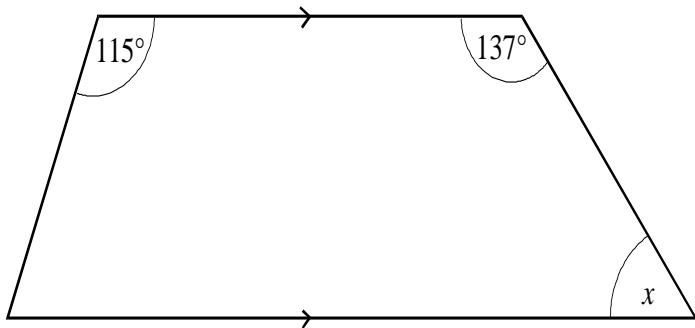
Answer .....

2. Find the value of  $3x + 4y$   
when  $x = 2$  and  $y = 5$

.....  
.....

Answer .....

3. The diagram shows a trapezium.



Not drawn accurately

Calculate the value of  $x$ .

Answer ..... degrees

4. Solve the equation

$$2x + 5 = 3$$

.....  
.....

Answer  $x =$  .....

5. From the list of numbers

4 9 20 27 32 51  
65 81 125

Write down the cube numbers

.....  
.....

Answer .....

Read the question carefully before you start.

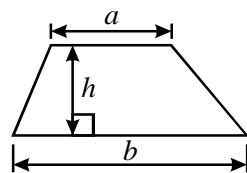
Remember these diagrams are **Not drawn to Scale**.

➤ Learn the main Area formulae:

- Rectangle  $= l \times w$
- Parallelogram  $= b \times ht$
- Triangle  $= \frac{1}{2} \times b \times ht$

➤ Area of a Trapezium is on the formulae sheet

$$\text{Area of trapezium} = \frac{1}{2}(a + b)h$$

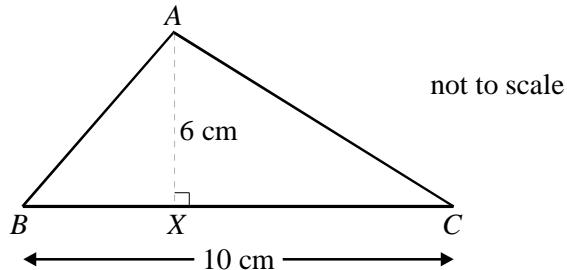


- The perimeter of **any shape** is the distance around the outside. (add all the sides)
- **Sometimes** you will be given an **Area** and be asked to find a length. So, read the question carefully.
- Remember **UNITS!**



# Area

1. The diagram shows a triangle  $ABC$ . The base  $BC = 10 \text{ cm}$ .  
The perpendicular height  $AX = 6 \text{ cm}$ .

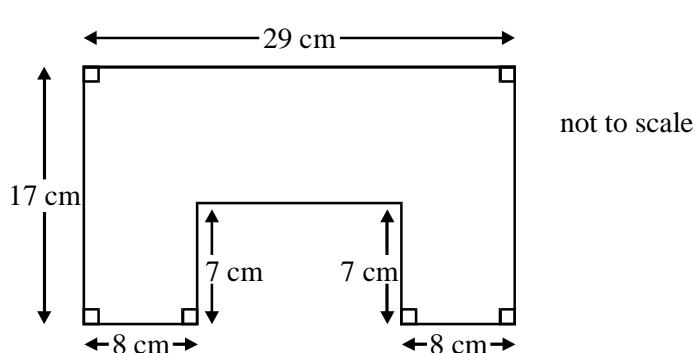


Calculate the area of the triangle.

.....  
.....

Answer.....  $\text{cm}^2$  (2)

2.



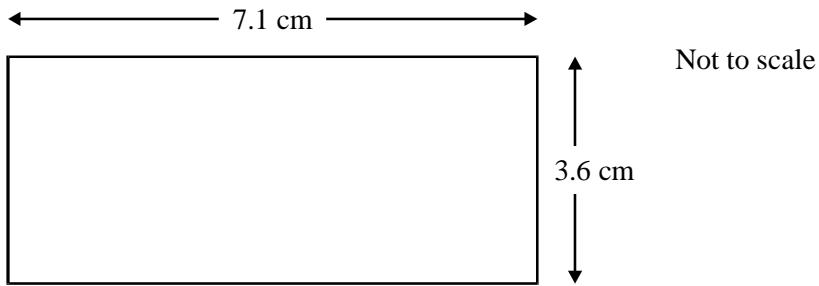
Calculate the area of the shape.

.....  
.....  
.....  
.....  
.....

Answer.....  $\text{cm}^2$  (3)



3. A rectangle has length 7.1 cm and width 3.6 cm.

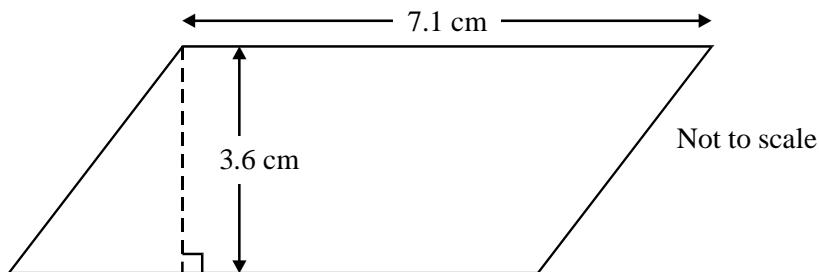


(a) Calculate the area of the rectangle.  
Give your answer to 1 decimal place.

.....  
.....

Answer .....  $\text{cm}^2$  (3)

(b) The diagram shows a parallelogram.

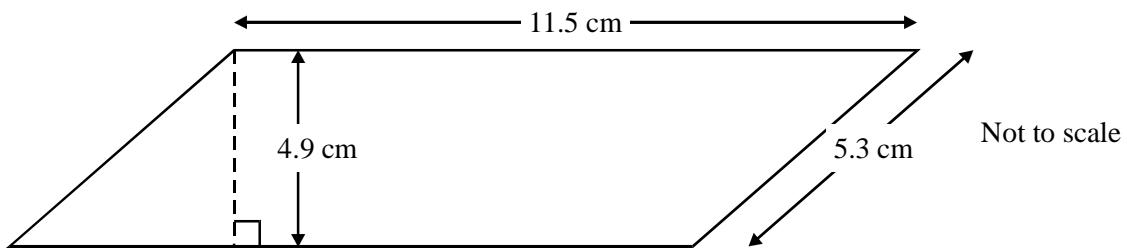


Explain why the area of the parallelogram is equal to the area of the rectangle.

.....

(2)

(c) This diagram shows a different parallelogram of length 11.5 cm, height 4.9 cm and slant height 5.3 cm.



Calculate the area of this parallelogram.

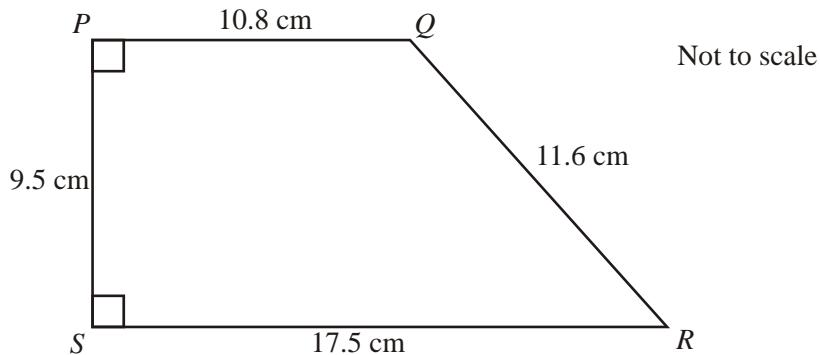
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Answer .....  $\text{cm}^2$  (2)

 4. In the diagram below,  $PQ = 10.8 \text{ cm}$ ,  $QR = 11.6 \text{ cm}$ ,  $RS = 17.5 \text{ cm}$  and  $PS = 9.5 \text{ cm}$ .

The angles at  $P$  and  $S$  are  $90^\circ$



Calculate the area of  $PQRS$ .

---

---

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Answer .....  $\text{cm}^2$  (2)  
(Total 14 marks)

# DAY 3

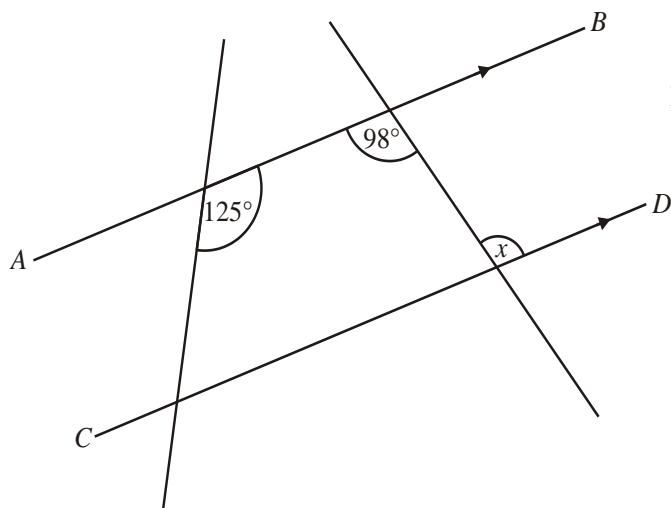
1. Find the value of  $3x + 4y$

when  $x = 6$  and  $y = -3$

.....  
.....

Answer.....

2. The lines  $AB$  and  $CD$  are parallel.



Work out the value of  $x$ .  
Give a reason for your answer.

Answer ..... degrees

Reason

.....  
.....

3. In this question, the letters  $x$ ,  $y$  and  $z$  represent lengths.  
State whether each expression could represent a length, an area or a volume.

(a)  $\pi x^2 y$   
Answer.....

(b)  $x + y + z$   
Answer.....

(c)  $x^2 + y^2$   
Answer.....

4. Here are 4 expressions

$n \div 3$

$n + 3$

$n^2$

$3 \div n$

(a) If  $n = 3$  which expression has the greatest value, show your working.

.....

.....

Answer.....

(b) If  $n = 0.3$  which expression has the greatest value? Show your working.

.....

.....

Answer.....

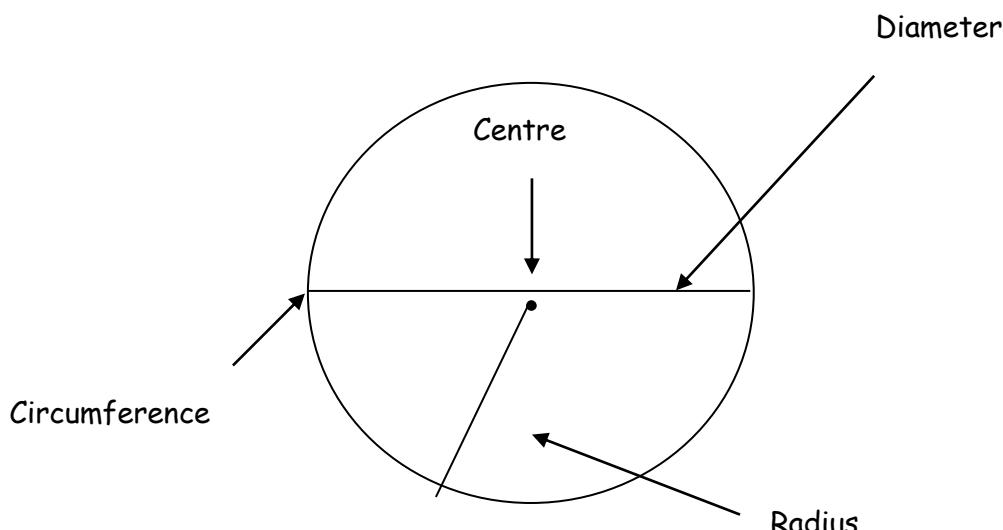
## Hints and Tips

## Circles

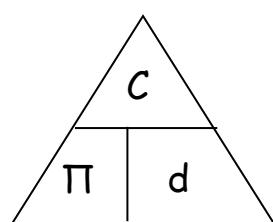
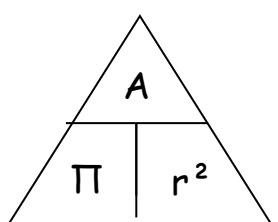
Read the question carefully before you start.

You may be asked to find the Circumference or Area of a circle.

- Circumference is just the perimeter of a circle
- The radius is the distance from the centre of a circle to any point on the circumference
- The diameter goes from one point on the circumference to the opposite side of the circle, through the centre
- The diameter is double the radius
- Don't be put off by  $\pi$  - it's just a number, 3.14...
- Make sure you know where the  $\pi$  button is on your calculator
- Area of a circle 
$$A = \pi r^2$$
  
(remember to square the radius first then multiply by  $\pi$  )
- Circumference of a circle 
$$C = 2\pi r$$
 or 
$$C = \pi d$$
- Don't forget the units
- Note: the perimeter of a semi-circle has three sides



You may find formula triangles useful:

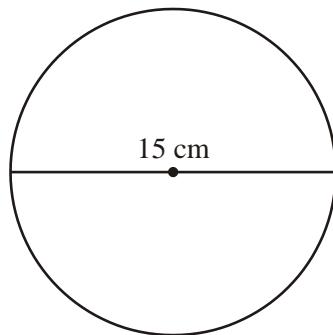


# Area and Circumference



1. The diameter of a circle is 15 cm.

Calculate the circumference of the circle.



Not drawn accurately

.....

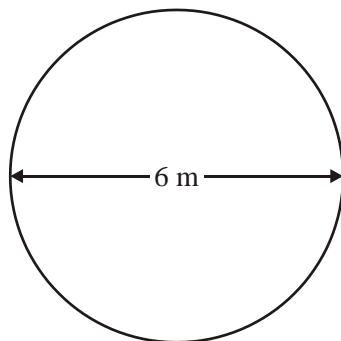
.....

Answer ..... cm (2)



2. Jasmin has a pond in her garden.

The surface of the pond is a circle of diameter 6 metres.



Calculate the area of a circle of diameter 6 metres.

Give your answer in terms of  $\pi$

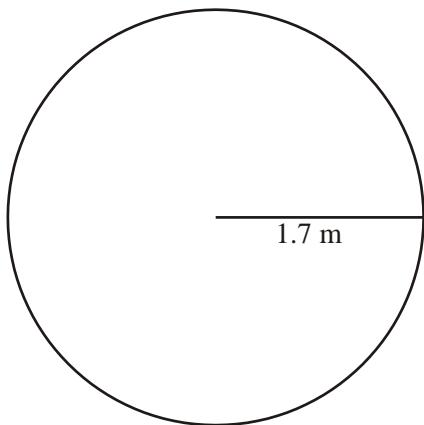
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Answer .....  $\text{m}^2$  (2)



3. A circular flowerbed has a radius of 1.7 m.



Not drawn accurately

Calculate the area of the flowerbed.

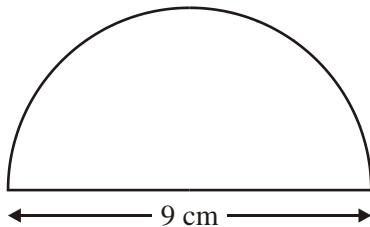
State the units of your answer.

.....  
.....  
.....

Answer ..... (3)



4. A semi-circular protractor has a diameter of 9 cm.



Not drawn accurately

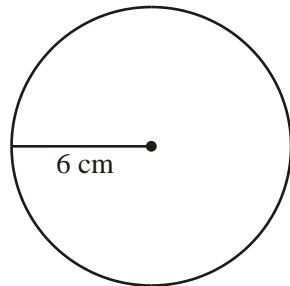
Calculate the perimeter.

.....  
.....

Answer ..... cm (3)



5. The diagram shows a circle of radius 6 cm.



Not drawn accurately

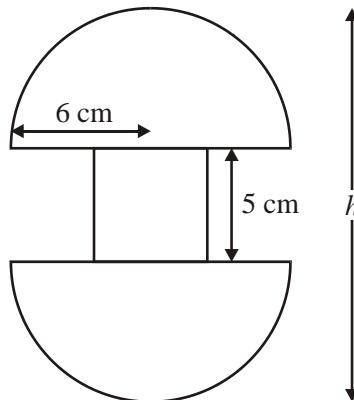
(a) Work out the area of the circle.  
Give your answer in terms of  $\pi$

.....  
.....  
.....

Answer ..... (3)

(b) A badge is made out of 2 semicircles and a square, as shown.  
The radius of the semicircle is 6 cm.  
The square has side 5 cm.

Not to scale



(i) Write down the area of the badge.  
Give your answer in terms of  $\pi$ .

.....  
.....

Answer ..... (1)

(Total 14 marks)

# DAY 4

1. Find the value of  $a^3 + b^2$   
when  $a = 2$  and  $b = 5$

.....  
.....

Answer .....

2. The students in class 10W  
measure their hand spans.

(a) Juan's hand span is  $x$  cm.  
George's hand span is 1 cm  
longer.

Write down an expression  
for George's hand span, in  
terms of  $x$ .

.....  
.....

Answer ..... cm

(b) Vicky's hand span is  $y$  cm.  
Emma's hand span is 2 cm  
shorter.

Write down an expression  
for Emma's hand span, in  
terms of  $y$ .

.....  
.....

Answer ..... cm

3. Expand  $3(y - 4)$

.....  
.....

Answer .....

4. A model of a new housing  
estate is built to a scale of  
 $1 : 500$

A house is 15 metres high. Work out  
the height of the model. Give your  
answer in centimetres.

.....  
.....

Answer .....

5. Work out the value of  $2^3 \times 3^2$

.....  
.....

Answer .....

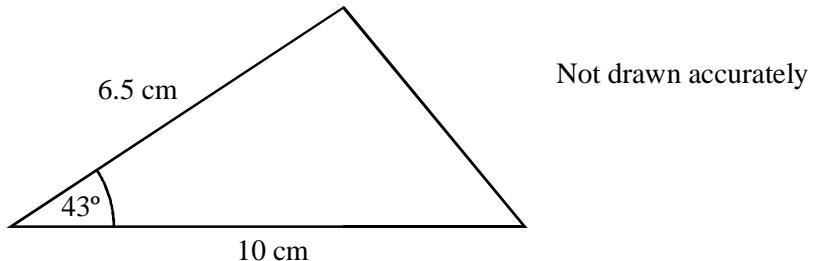
Read the question carefully before you start.

You need a pencil, ruler and a protractor to complete this work.

- Remember the following:
  - no arcs = no marks
  - you must draw angles as accurately as possible ( $\pm 2^\circ$ )
  - you must draw lines as accurately as possible ( $\pm 1\text{mm}$ )
- 'Bisect' means 'cut in half'
- Sometimes you are only allowed to use certain equipment (i.e. Use a **compass** and ruler to construct.....)

# Constructions

1. In the space below, make an accurate drawing of this triangle.  
The base line has been drawn for you.



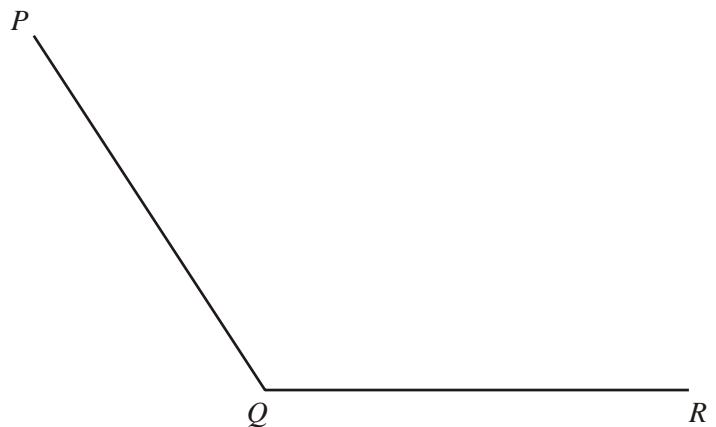
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10 cm

(2)



2. Using ruler and compasses only, construct the bisector of angle PQR.



(2)



3. (a) Draw a circle of radius 4 cm.

(1)

(b) Write down the length of the diameter of the circle.

Answer ..... cm (1)

(c) On your diagram draw a tangent to the circle. (1)

(d) On your diagram draw a chord of length 6 cm inside the circle. (2)



4. In triangle  $PQR$ , the side  $PQ = 7.5$  cm.

Angle  $P = 70^\circ$  and angle  $R = 80^\circ$ .

Make an accurate drawing of the triangle in the space below.

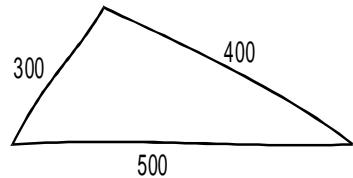
The line  $PQ$  has been drawn for you.

$P$  \_\_\_\_\_  $Q$

(3)



5. Mutasem draws a rough sketch of a triangle with sides 300 m, 400 m and 500 m.



Using ruler and compasses only, make an accurate scale drawing of the triangle.  
Use a scale of 1 cm to represent 50 m.

You must show clearly all your construction arcs. (3) (Total 15 marks)

# DAY 5

1. (a) Simplify  $5p + 2q - q + 2p$

.....  
.....

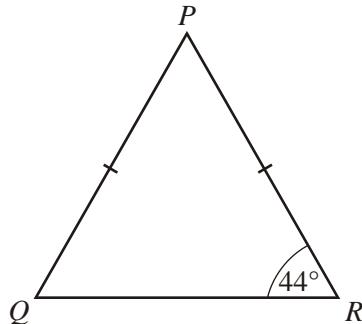
Answer .....

(b) Multiply out  $4(r - 3)$

.....  
.....

Answer .....

2. (a) Triangle PQR is isosceles.  
 $PQ = PR$    Angle R =  $44^\circ$



Not drawn accurately

Calculate the size of angle P.

.....  
.....  
.....

Answer .....

3. Factorise

$$4x + 8$$

Answer .....

4. A model of a new housing estate is built to a scale of 1 : 500

A road on the model is 60cm long.  
Work out the actual length of the road. Give your answer in metres.

.....  
.....

Answer .....

5. A triangle has angles of  $63^\circ$ ,  $2x$  and  $x$

Work out the value of  $x$

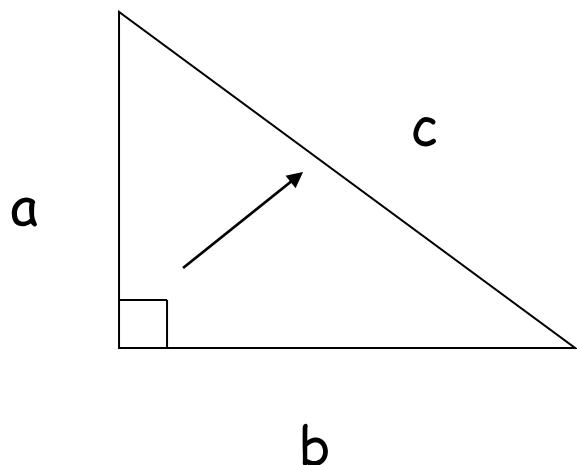
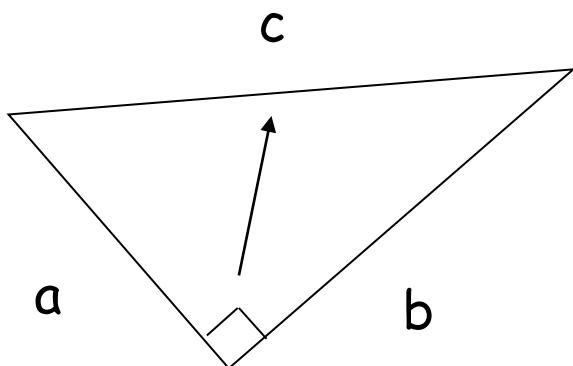
.....  
.....  
.....  
.....  
.....

Answer .....

Read the question carefully before you start.

Pythagoras can be used to find a missing length in a right angled triangle if 2 sides are known

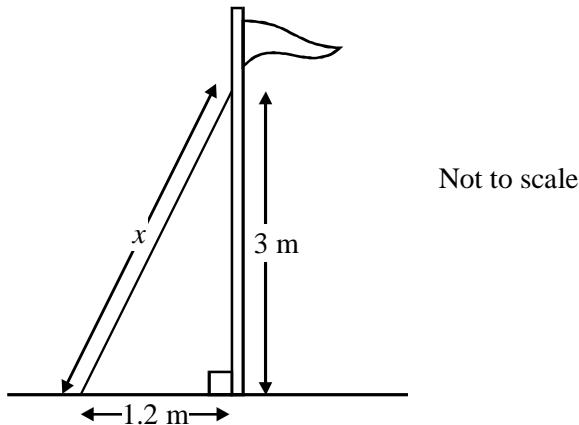
- Learn Pythagoras' Theorem:  $c^2 = a^2 + b^2$
- Label your triangle a, b and c
- The hypotenuse which is opposite the right angle (longest side) must be labelled c
- If you are looking for a short side, ie not the hypotenuse you will need to rearrange the formula:  $c^2 - a^2 = b^2$
- Always check that your answer is sensible. Check that the hypotenuse is still the longest side.



# Pythagoras



1. A support for a flagpole is attached at a height of 3 m and is fixed to the ground at a distance of 1.2 m from the base.



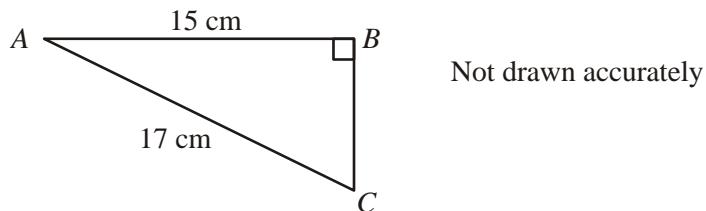
Calculate the length of the support (marked  $x$  on the diagram).

.....  
.....  
.....  
.....  
.....

Answer ..... m (3)



2.  $ABC$  is a right-angled triangle.  
 $AB = 15 \text{ cm}$  and  $AC = 17 \text{ cm}$



Calculate the length of the side  $BC$ .

.....  
.....  
.....  
.....

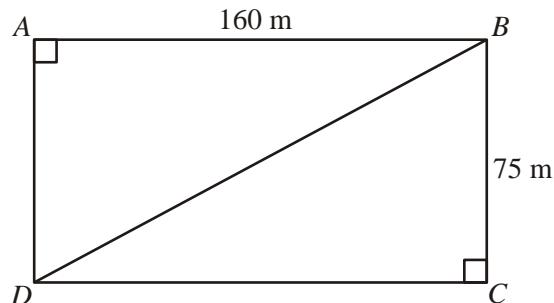


Answer ..... cm (3)

3. A rectangular field  $ABCD$  is shown.

The length of the field,  $AB = 160$  m.

The width of the field,  $BC = 75$  m.



Not to scale

Calculate the length of the diagonal  $BD$ .

Give your answer to a suitable degree of accuracy.

.....

.....

.....

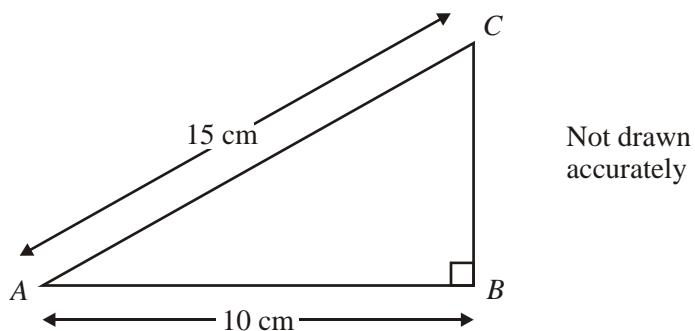
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Answer ..... m (4)



4. (a) The diagram shows a right-angled triangle  $ABC$ .

$AB = 10$  cm and  $AC = 15$  cm



Calculate the length of  $BC$ . Leave your answer as a square root.

.....

.....

.....

..... Answer ..... cm (3) (Total 13 marks)

# DAY 6

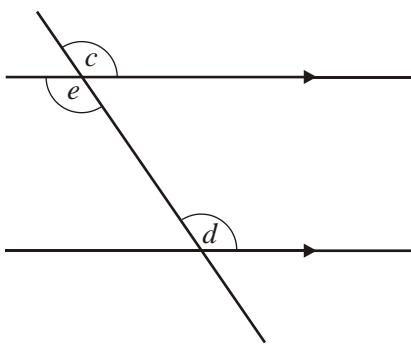
1. Factorise  $y^2 + 2y$

.....  
.....

Answer .....

2. The words in this list are used to describe angles.

alternate    corresponding    exterior  
interior    opposite



Not drawn accurately

Choose a word from the list to describe each of these pairs of angles.

(i)  $c$  and  $d$  are  
.....  
..... angles

(ii)  $d$  and  $e$  are  
.....  
..... angles

3. Simplify the expression

$$2c + 6d + 4c - 8c$$

.....  
.....

Answer .....

4. Solve the equation  $\frac{x}{5} = 12$

.....  
.....

Answer .....

5. A model of a new housing estate is built to a scale of 1 : 500

A house is 10 metres high. Work out the height of the model. Give your answer in centimetres.

.....  
.....

Answer .....

6. If  $x = 4$  and  $y = -3$  find the value of

(a)  $y^2 + 5 = \dots$

(b)  $4y + x = \dots$

(c)  $2x - y = \dots$

(d)  $\sqrt{x} = \dots$

## Hints and Tips

## Linear Sequences

Read the question carefully before you start.

- Look for the common difference between the numbers
- This difference tells you which multiplication table the sequence is based on
- e.g. Find the  $n^{\text{th}}$  term of 2, 5, 8, 11, 14, .....

2	5	8	11	14	.....
3	6	9	12	15	

3 times table as the gap is 3

difference = 3

$$n^{\text{th}} \text{ term} = 3n - 1$$

difference between the sequence and times table is -1

- To generate a sequence, just substitute  $n=1, n=2$  etc.

- Alternate method

$$n^{\text{th}} \text{ term} = \text{difference} \times n + 1^{\text{st}} \text{ number} - \text{difference}$$

e.g. 2, 5, 8, 11, 14, .....

difference = 3

1<sup>st</sup> term = 2

$$1^{\text{st}} \text{ term} - \text{difference} = 2 - 3$$

$$= -1$$

$$n^{\text{th}} \text{ term} = 3n - 1$$

Read the question carefully before you start.

For these questions you must remember that you will **not** have to calculate the exact value of  $x$ . You are aiming to get close to it and this will be **specified** in the question (i.e. Give your answer to 1 decimal place).

- Usually the first guess will be completed in the table for you (and the second if you are lucky)
- Find the two whole numbers in between which  $x$  must be.
- Find the two 1 decimal values in between which  $x$  must be etc.
- Once you are working with the **specified** number of decimal places TRY HALF WAY between. This will tell you which value  $x$  is closed to.
- Your answer must have the number of decimal places that are asked for in the question.

# Sequences



1. A sequence of numbers is shown.

2      5      8      11      14

(a) Find an expression for the  $n$ th term of the sequence.

.....  
.....

Answer ..... (2)

(b) Explain why 99 will not be a term in this sequence.

.....  
.....  
.....

(2)



2. A pattern using pentagons is made of sticks.

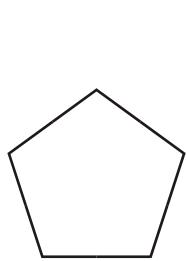


Diagram 1

5 sticks

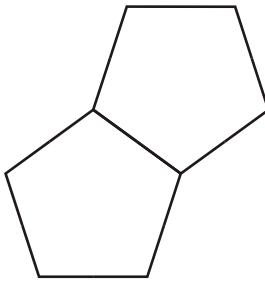


Diagram 2

9 sticks

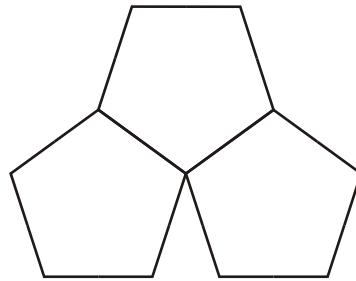


Diagram 3

13 sticks

(a) How many sticks are needed for Diagram 5?

.....  
.....

Answer ..... (2)

(b) Write down an expression for the number of sticks in Diagram  $n$ .

.....  
.....

Answer ..... (2)

(c) Which Diagram uses 201 sticks?

.....  
.....  
.....  
.....

Answer ..... (3)

 3. The  $n$ th term of a sequence is  $4n + 1$

Write down the first **three** terms of the sequence.

.....  
.....

Answer ..... (2)

## Trial and Improvement



1. Laura is using trial and improvement to find a solution to the equation

$$x^3 + 2x = 60$$

The table shows her first two tries.

Continue the table to find a solution to the equation.

$x$	$x^3 + 2x$	Comment
3	33	too small
4	72	too big

Give your answer correct to 1 decimal place.

Answer  $x = \dots$  (3)



2. Dario is using trial and improvement to find a solution to the equation

$$x + \frac{1}{x} = 5$$

The table shows his first trial.

$x$	$x + \frac{1}{x}$	Comment
4	4.25	Too low

Continue the table to find a solution to the equation.

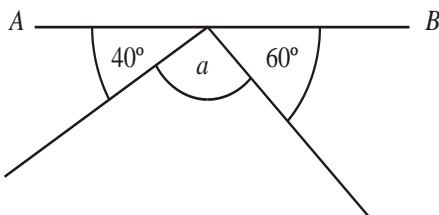
Give your answer to 1 decimal place.

Answer  $x = \dots$  (4)

(Total 20 marks)

# DAY 7

1. The diagram shows three angles on a straight line  $AB$ .

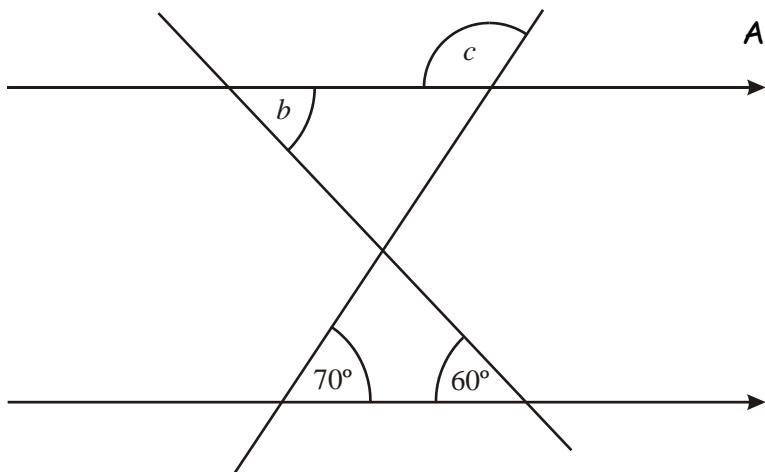


Not drawn accurately

Work out the value of  $a$ .

.....  
.....

Answer  $a = \dots$   
degrees



Answer .....

4. Work out the value of:  
Not drawn accurately

(a)  $5^3 - 4^3 = \dots$

(b)  ${}^3\sqrt{8 + 2^4} = \dots$

(c)  $3^3 - 5 = \dots$

Work out the values of  $b$  and  $c$ .

Answer  $b = \dots$  degrees

$c = \dots$  degrees

2 Simplify the expression  
 $2c - d + 4d - 8c$

Answer .....

3. (a) An ordinary dice has six faces. Write down an expression for the total number of faces on  $x$  ordinary dice

Answer .....

(b) A tetrahedral dice has four faces. Write down an expression for the total number of faces on  $x$  ordinary dice and 5 tetrahedral dice.

Read the question carefully before you start.

➤ There are 4 transformations

Rotation

Enlargement

Translation

Reflection

If you are asked to **describe fully** the transformation that has taken place you need to write down the type of transformation. If it is a

Rotation: you must state the centre of rotation, the angle it has turned and the direction

e.g. rotation of  $90^\circ$  clockwise about  $(1,0)$

Translation: you must state the direction in which the shape has moved. You can write this simply, i.e. it has moved 2 squares right and 3 up but it is better to use vectors such as:

$$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$$

Reflection: you must give the equation of the line of symmetry e.g.  $x = 2$  ,  $y = x$  etc.

Enlargement: you must give the centre of enlargement and the scale factor.

Note: positive number - makes it bigger

fraction - make it smaller

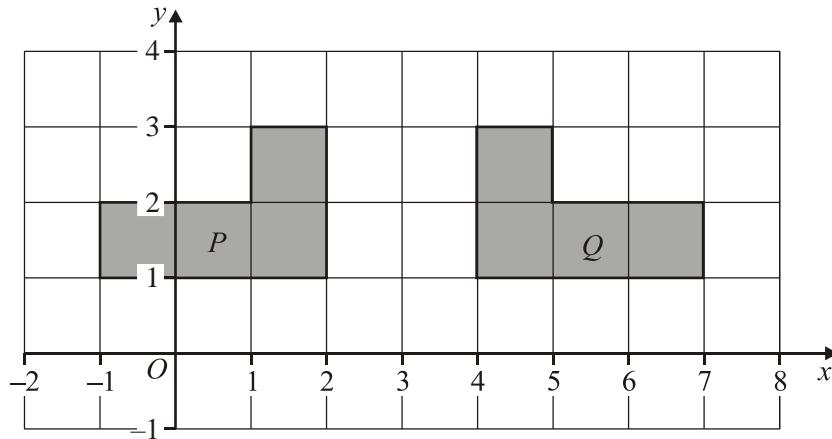
negative value - turn the shape up side down

➤ Remember you can use tracing paper to help you - just ask.



# Transformations

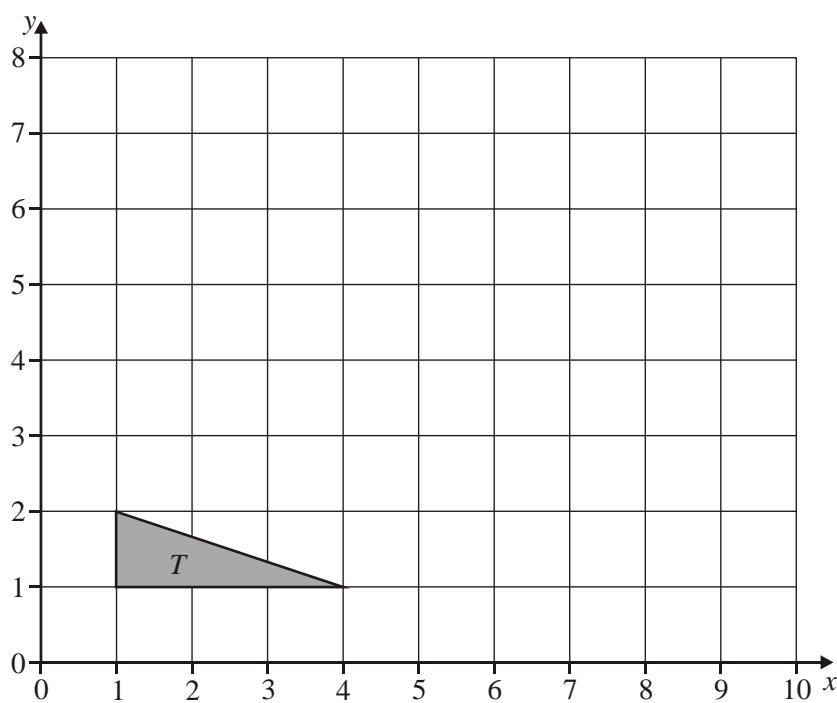
1. (a) The diagram shows two shapes  $P$  and  $Q$ .



Describe fully the **single** transformation which takes shape  $P$  to shape  $Q$ .

..... (2)

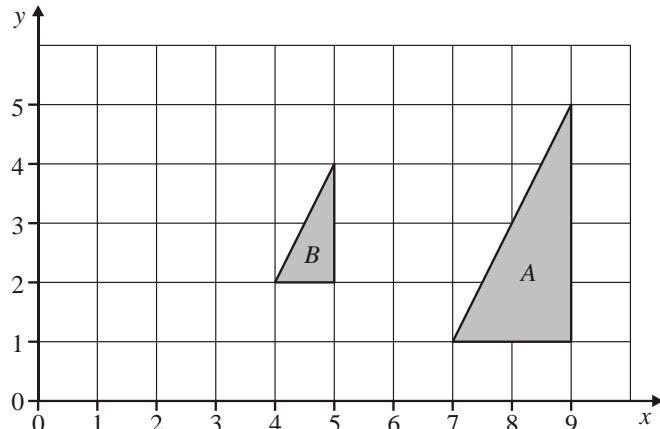
(b) The vertices of triangle  $T$  are  $(1,1)$ ,  $(1,2)$  and  $(4,1)$ .



Enlarge triangle  $T$  by scale factor 2, with  $(0,0)$  as the centre of enlargement.

(3)

2. The diagram shows two triangles  $A$  and  $B$ .

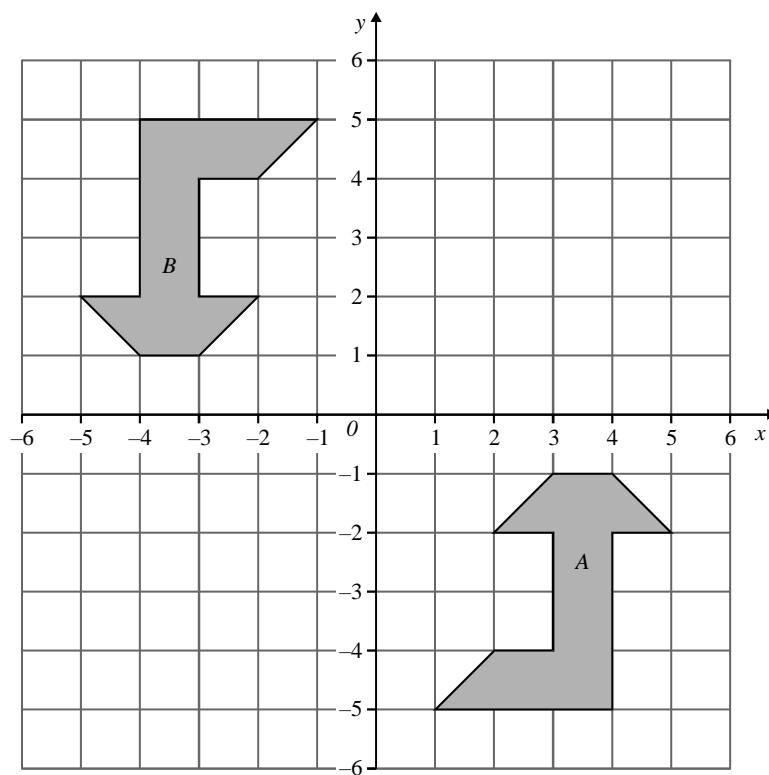


Describe fully the single transformation that maps triangle  $A$  onto triangle  $B$ .

.....  
.....

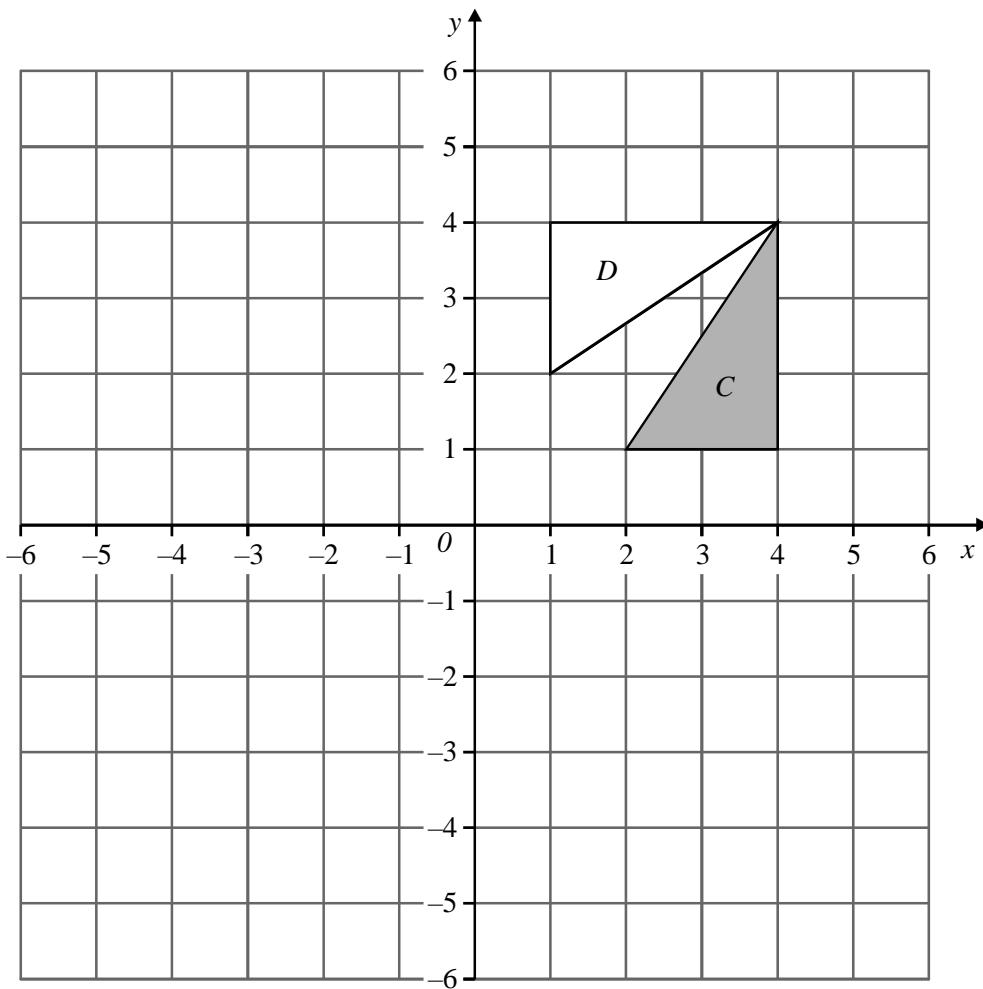
(3)

3. (a) The diagram shows two identical shapes  $A$  and  $B$ .



Describe fully the **single** transformation which takes shape  $A$  to shape  $B$  (3)

(b) The diagram shows two triangles,  $C$  and  $D$ .



(i) Translate the shaded triangle  $C$  by the vector  $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$

Label the new triangle  $E$ .

(2)

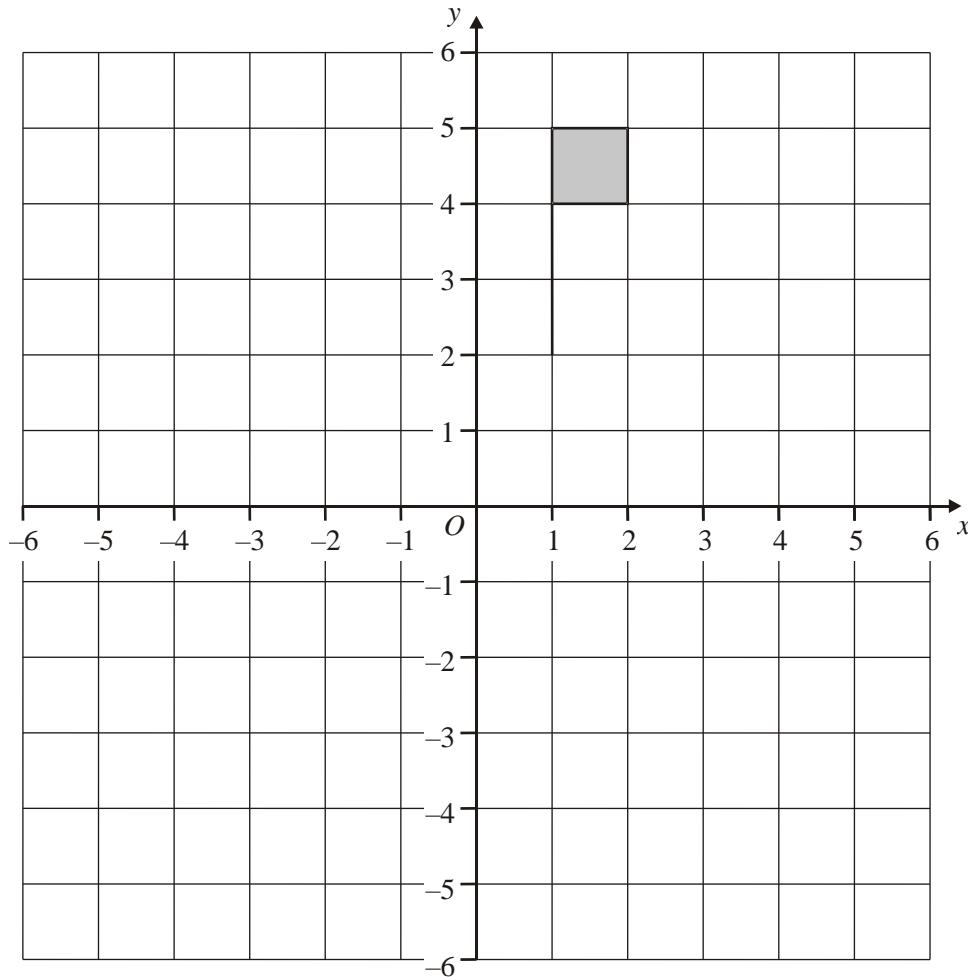
(ii) Describe fully the **single** transformation which maps triangle  $C$  to triangle  $D$ .

.....

.....

(2)

4. The diagram shows a shaded flag.



(a) Rotate the shaded flag  $90^\circ$  anticlockwise about the origin.  
Label this new flag with the letter A.

(3)

(b) Reflect the original shaded flag in the line  $y = 1$ .  
Label this new flag with the letter B.

(2)

(Total 20 marks)

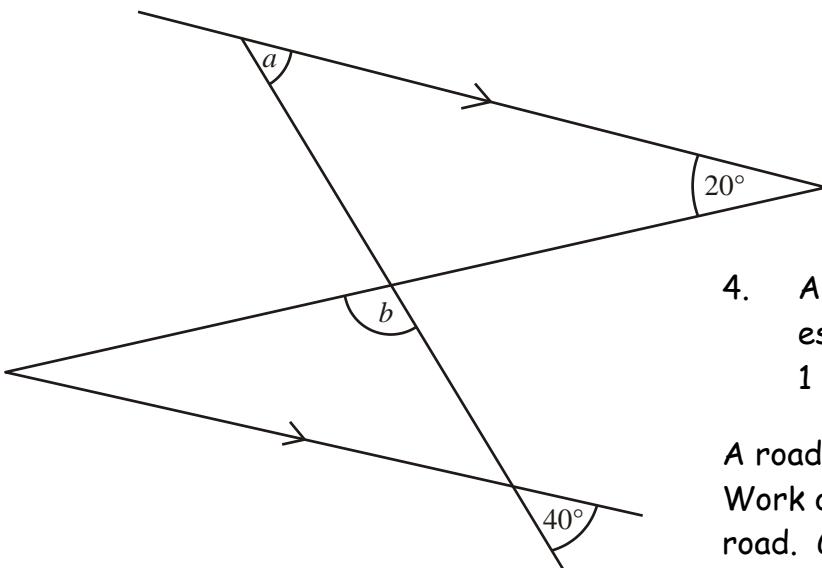
# DAY 8

1. (a) Work out the size of angles  $a$  and  $b$ .

3. Find the value of  $p^3 + 3q$  when  $p = 2$  and  $q = -1$

.....

Answer .....



Not drawn accurately

4. A model of a new housing estate is built to a scale of  $1 : 400$

A road on the model is 40cm long. Work out the actual length of the road. Give your answer in metres.

.....

Answer .....

Answer  $a = \dots$  degrees

$b = \dots$  degrees

2. (a) Factorise  $x^2 + 5x$

Answer .....

(b) Factorise  $10a + 5$

Answer .....

(c) Factorise  $x^2 - 4x$

Answer .....

# DAY 9

1. Find the exact value of

$$\frac{1}{a} + \frac{1}{b} \quad \text{when } a = 0.5 \text{ and } b = 2$$

.....  
.....

Answer .....

2.(a) Solve the equation.

$$5x + 4 = -1$$

.....  
.....

Answer .....

(b) Solve the equation.  $6r + 2 = 8$

.....  
.....

Answer .....

(c) Solve the equation.  $4p - 5 = 11$

.....  
.....

Answer .....

3. If  $p = 4$  and  $q = -9$  find the value of

(a)  $4p - 2q$

Answer .....

(b)  $2p^2$

Answer .....

(c)  $2pq$

Answer .....

4. Factorise  $15x - 20$

.....  
.....

Answer .....

5. Write down the value of the following:

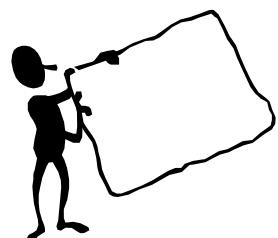
(a)  $4^2 =$  .....

(b)  $\sqrt[3]{27} =$  .....

(c)  $2^4 =$  .....

(d)  $(-3)^2 =$  .....

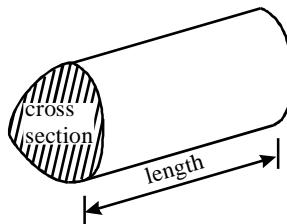
(e)  $-(3^2) =$  .....



Read the question carefully before you start.

- If a volume question comes up in your exam have a look at the inside cover of the paper. You will see the following diagram

**Volume of prism** = area of cross section  $\times$  length



- To calculate a **volume** you must first find the **area** of the cross section and multiply by its' length.
- Cross-sections are usually:
  - Circles  $= \pi r^2$
  - Rectangles  $= l w$
  - Triangles  $= \frac{1}{2} b h$
- Make sure that you know which dimension is the **length**
- Remember **UNITS!**
- Sometimes you will be given a **volume** and be asked to find a **length**. So, read the question carefully.





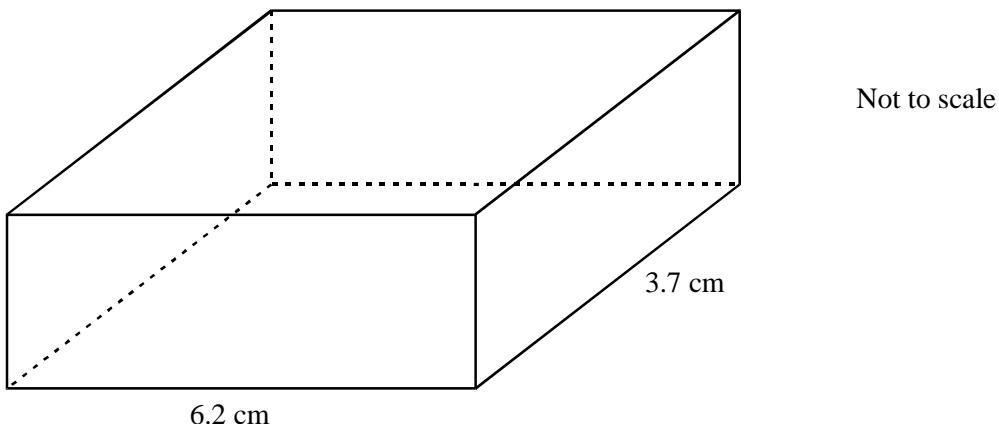
# Volume



1. A cuboid is shown below.

The cuboid has volume  $60 \text{ cm}^3$ .

The base is 6.2 cm long and 3.7 cm wide.



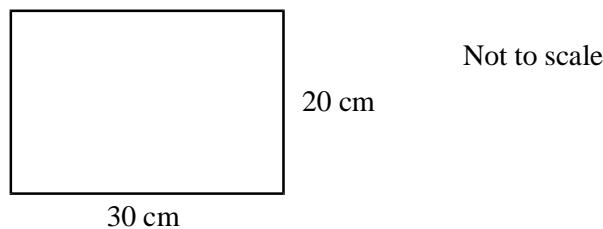
(a) Calculate the height of the cuboid.

Give your Answer to a sensible degree of accuracy.

.....  
.....  
.....  
.....  
.....

Answer ..... cm (3)

(b) A tile is shown below.



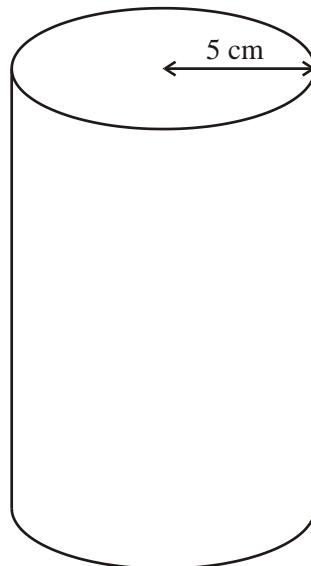
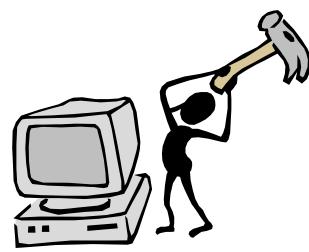
Find the area of the tile.

Give your answer in  $\text{m}^2$ .

.....  
.....  
.....  
.....  
.....

Answer .....  $\text{m}^2$  (2)

2. A cylinder has a radius of 5 cm.



Not to scale

(a) Calculate the circumference of a circular end of the cylinder.

.....

.....

.....

Answer ..... cm (2)

(b) The cylinder has a volume of  $250 \text{ cm}^3$ .  
Calculate the height of the cylinder.

.....

.....

.....

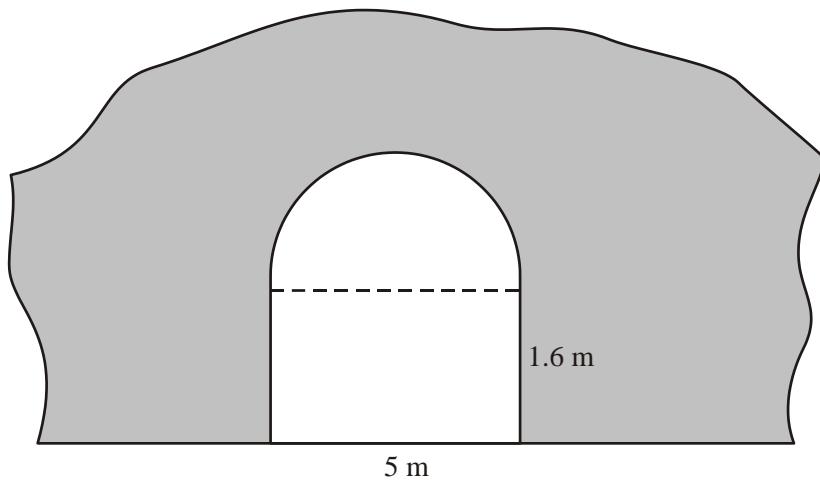
.....

Answer ..... cm (3)



3. The sketch shows the entrance to a tunnel.

The uniform cross-section of the tunnel is in the shape of a semi-circle over a rectangle.



Not to scale

The rectangle is 5 metres wide and 1.6 metres high.

The tunnel is 230 metres long.

Calculate the volume of earth removed in digging the tunnel.

.....

.....

.....

.....

.....

.....

.....

.....

Answer .....  $\text{m}^3$  (5)

(Total 15 marks)

# DAY 10

### 1. Solve the equation

$$4(y - 3) = 18$$

.....

.....

.....

Answer .....

2. In this question, the letters  $x$ ,  $y$  and  $z$  represent lengths. State whether each expression could represent a length, an area or a volume.

(a)  $x + y$

Answer.....

(b)  $\times y$

Answer.....

(c)  $\frac{xy}{z}$

Answer.....

3. Solve the equation  $\frac{x}{4} = 3$

Answer .....

4. A model of a new housing estate is built to a scale of 1 : 600

A road on the model is 70cm long.  
Work out the actual length of the road. Give your answer in metres.

5. Draw lines on the diagram to show which values are equal. One line has been drawn for you.

$$2^5 - \sqrt[3]{27}$$

5

3<sup>4</sup>

81

$$\sqrt[3]{125}$$

29

$$-4 \times -2$$

1

3°

8

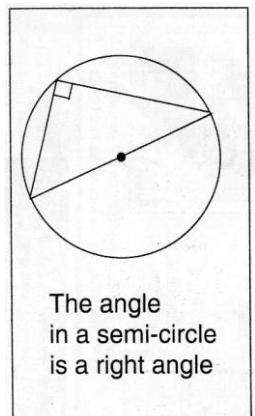
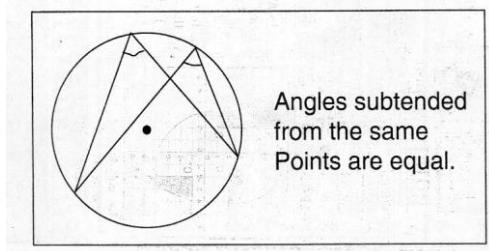
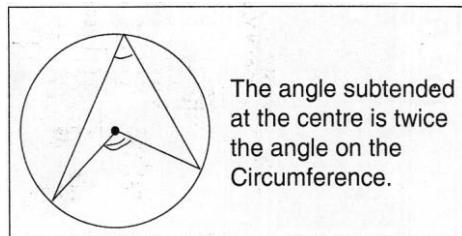
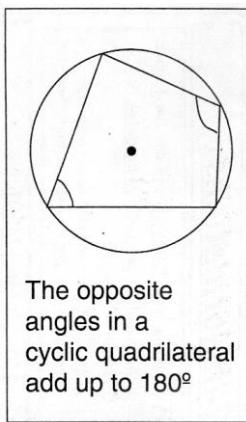
1

Read the question carefully before you start.

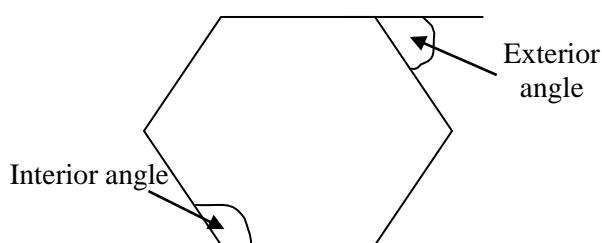
Remember these diagrams are **Not drawn to Scale**.

So don't use a *Protractor* to measure the angles.

➤ Learn the four Circle Theorems

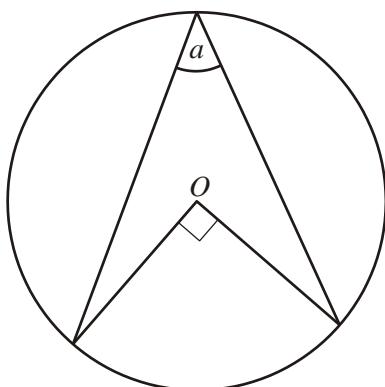


- Sum of the exterior angles of any polygon =  $360^\circ$ .
- Sum of the Interior angles =  $(n-2) \times 180^\circ$   
(where  $n$  = number of sides)



# Angles

1. (a) In the diagram,  $O$  is the centre of the circle.

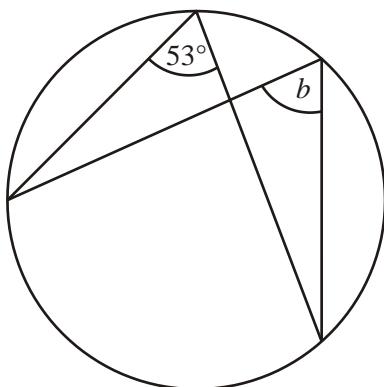


Not drawn accurately

Write down the value of  $a$ .

Answer ..... degrees (1)

(b)

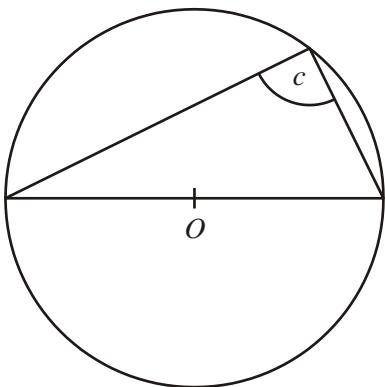


Not drawn accurately

Write down the value of  $b$ .

Answer ..... degrees (1)

(c) In the diagram,  $O$  is the centre of the circle.

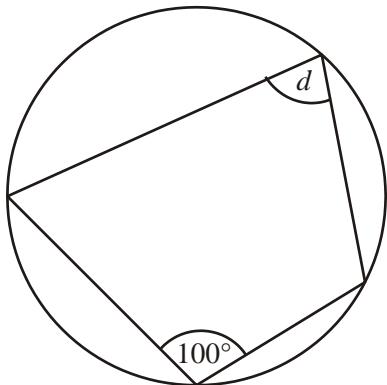


Not drawn accurately

Write down the value of  $c$ .

Answer ..... degrees (1)

(d)

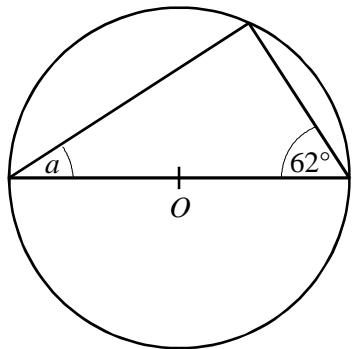


Not drawn accurately

Write down the value of  $d$ .

Answer ..... degrees (1)

2. (a) In the diagram,  $O$  is the centre of the circle.



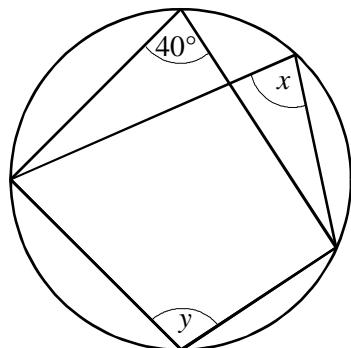
Not drawn accurately

Calculate the value of  $a$ .

.....  
.....

Answer ..... degrees (2)

(b)



Not drawn accurately

(i) Write down the value of  $x$ .

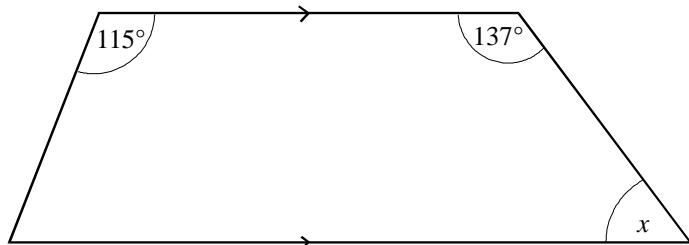
Answer ..... degrees (1)

(ii) Calculate the value of  $y$ .

.....  
.....

Answer ..... degrees (1)

3. The diagram shows a trapezium.

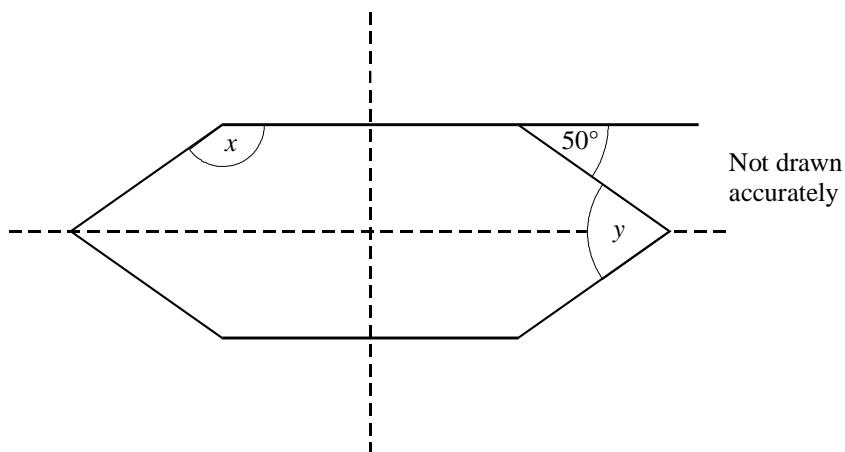


Calculate the value of  $x$ .

.....  
.....

Answer ..... degrees (2)

4. (a) The diagram shows a hexagon.  
The hexagon has two lines of symmetry as shown.



(i) Work out the value of  $x$ .

.....

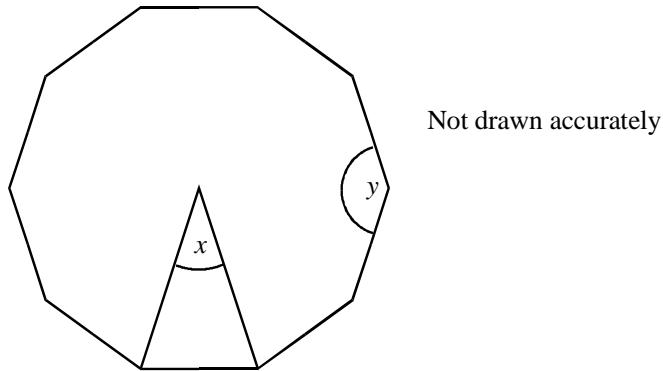
Answer ..... degrees (1)

(ii) Work out the value of  $y$ .

.....

Answer ..... degrees (2)

5. The diagram shows a regular decagon.



(a) Work out the angle at the centre of the decagon, marked  $x$  on the diagram.

.....  
.....

Answer ..... degrees (2)

(b) Work out the size of the interior angle, marked  $y$  on the diagram.

.....  
.....

Answer ..... degrees (2)

6. (a) A regular polygon has 9 sides.

Calculate the size of an interior angle.



.....

Answer ..... degrees (2)

(Total 19 marks)