Sheet C1   The Easy TakTiles
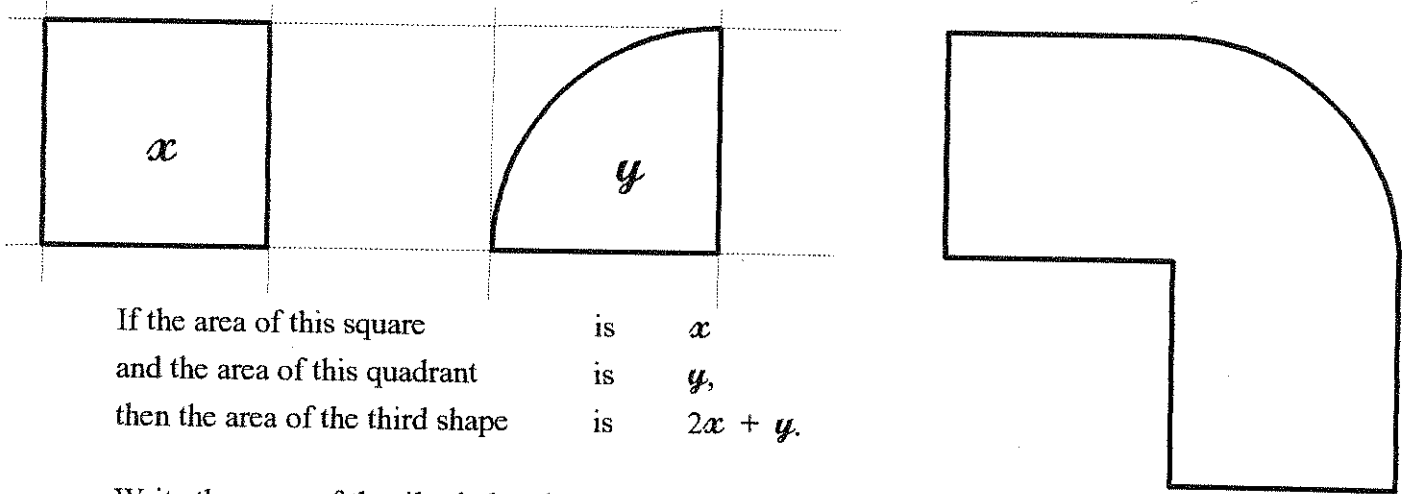
If the area of this square   is x
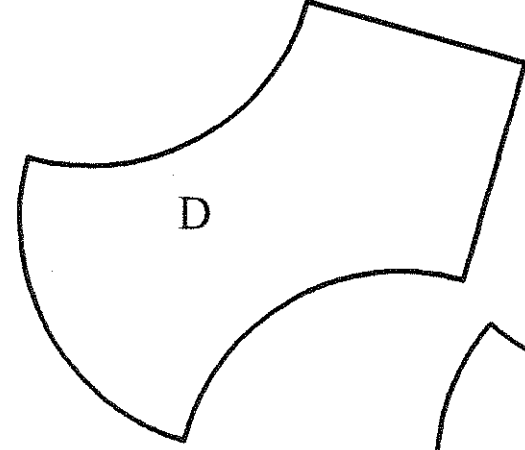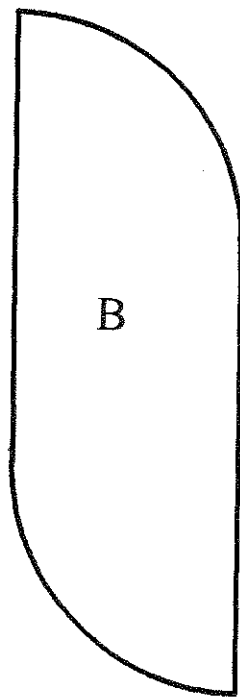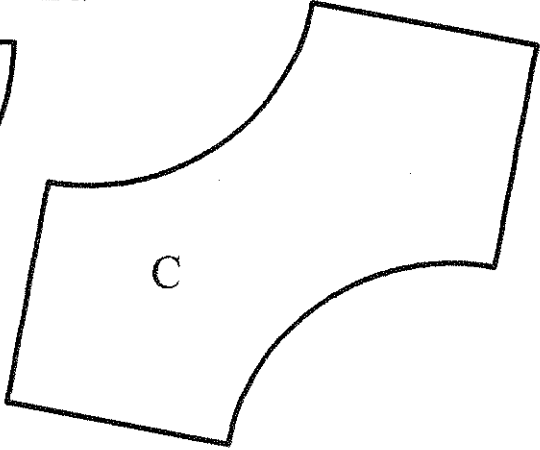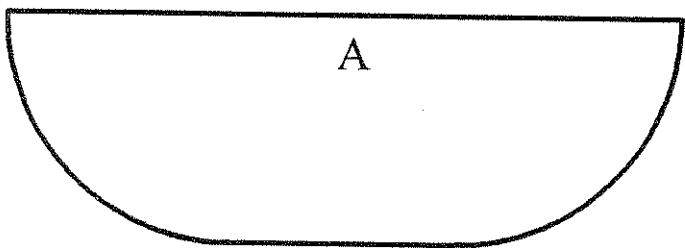
and the area of this quadrant   is y,

then the area of the third shape   is $2x + y$.

Write the areas of the tiles below in terms of x and y.
Draw in lines to show the squares and quadrants.

A

a =

 =

b =

 =

c =

 =

d =

 =

e =

 =
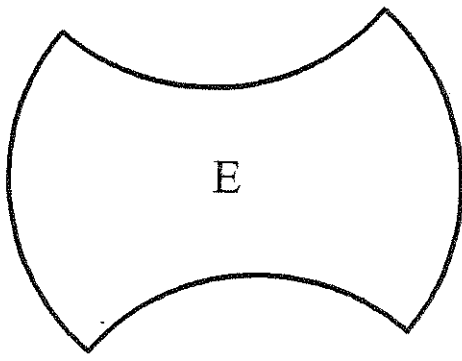
B

C

D

E

NOTE: Keep this sheet for reference.

Sheet C2   **Shapes Made of TakTiles**

Show how Shape 1 can be made by fitting tiles A, C and D together.
Draw lines where they join.

Use the area of each tile (from Sheet C1)
to find the total area of Shape 1.

Shape 1

<u>Check your answer</u> by adding up (and
subtracting) squares and quadrants.

Area =   *a + c + d*

= *(x + 2y) + (*

=

Shape 2

Area =

=

=

Shape 3

Area =

=

=

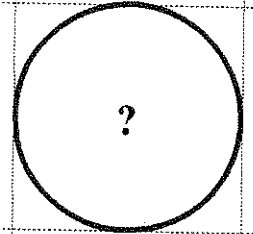Now tackle Shapes 2
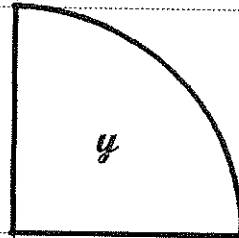and 3 in the same way.

Explain to your neighbour
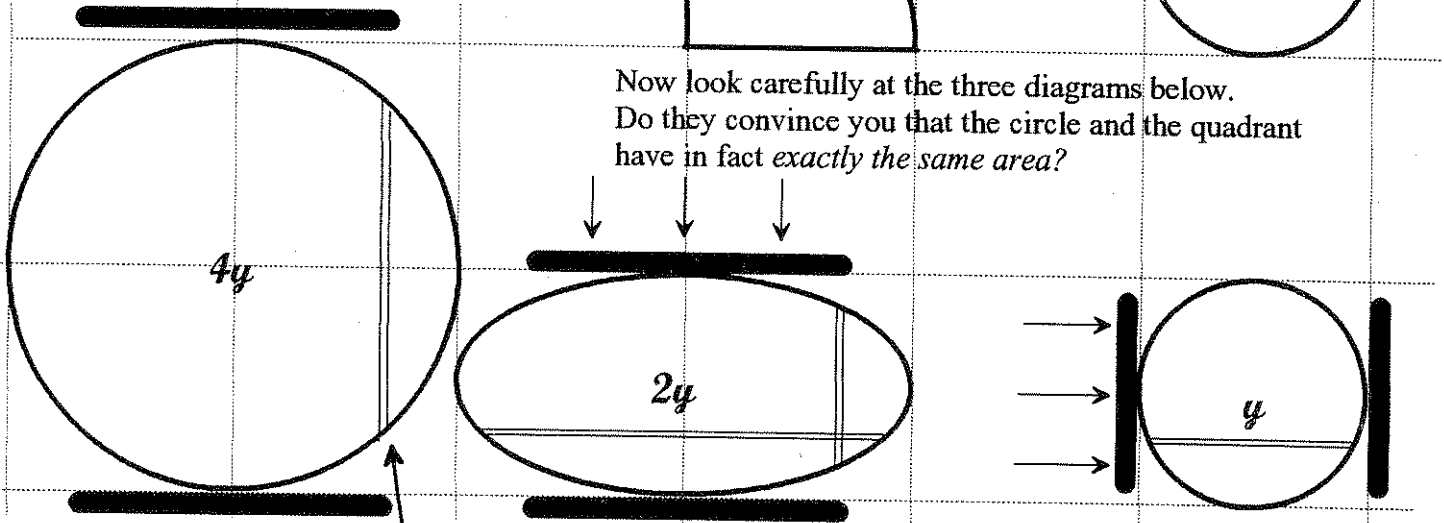how you arrived at each of
your answers.

Sheet C3   'Squashing' the Circle

Compare the area of the quadrant, y ,
with the area of the circle.

Which do you think is the bigger?

y

?

Now look carefully at the three diagrams below.
Do they convince you that the circle and the quadrant
have in fact *exactly the same area?*

$4y$

$2y$

y

Think of it this way:

Step 1 The large circle above has area $4y$. If it is squashed to *half* its original height, then the
length (and area) of this strip in it is *halved*. Think of the circle *all* cut up into strips like this,
and you'll see that its total area must also be halved. So the area of the oval (or **ellipse**) is $2y$.

Step 2 Squash the ellipse horizontally until it is again a circle. Using the same reasoning we see
that once again the area is halved. *So the small circle has area y , the area of the quadrant.*
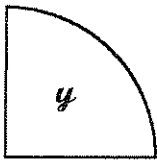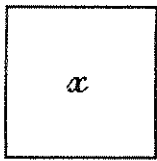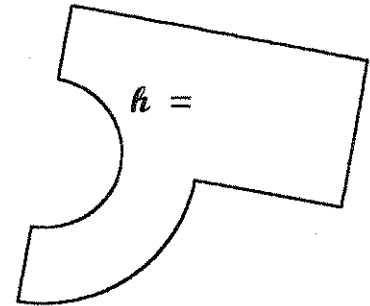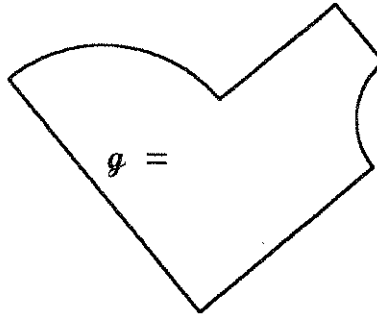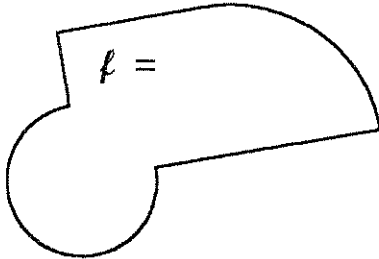
The *opposite* process to 'squashing' is **'stretching'**. By 'stretching' the small circle with area y,
find the area of each of the other shapes. Use the same type of reasoning.

y

Area

=

Area

Area

Area

=

Area

=

Area

=
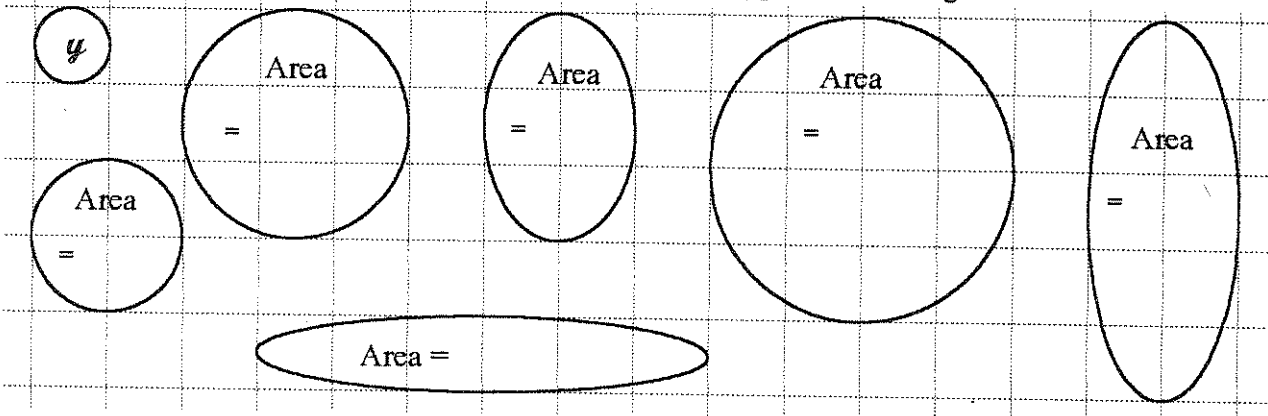
Area =

Sheet C4   The Other TakTiles

Find the areas of tiles F, G and H. It will help if you draw light
pencil lines to divide them up into squares and quadrants.

$f =$

$g =$

$h =$

x

y

Look at Shape 4. Find its area in terms of x and y :

(a) By adding squares and quadrants
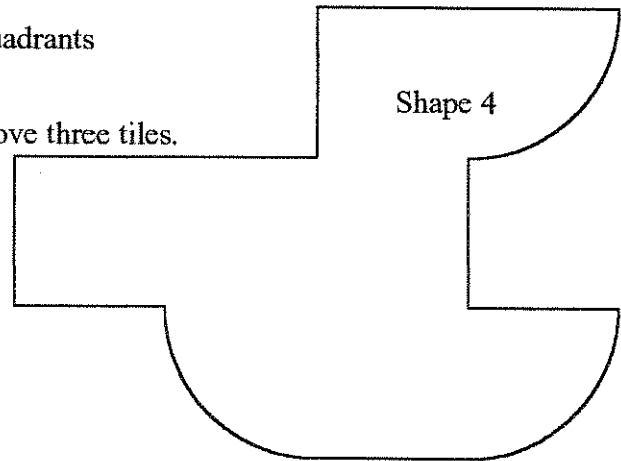   Area =

(b) By making it with the above three tiles.
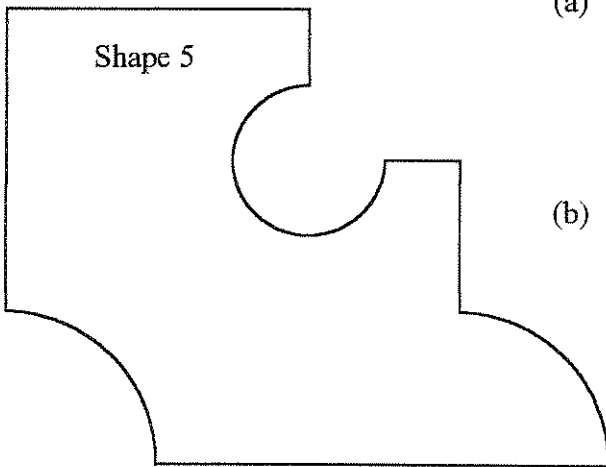(Show how by drawing lines.)

    Area $= f + g + h$

        =

        =

These two areas <u>should</u> be the same. Are they?

Shape 4

Make Shape 5 using three tiles.   Work out its area by the above two methods.

Shape 5

(a)   Area of shape =

              =

              =

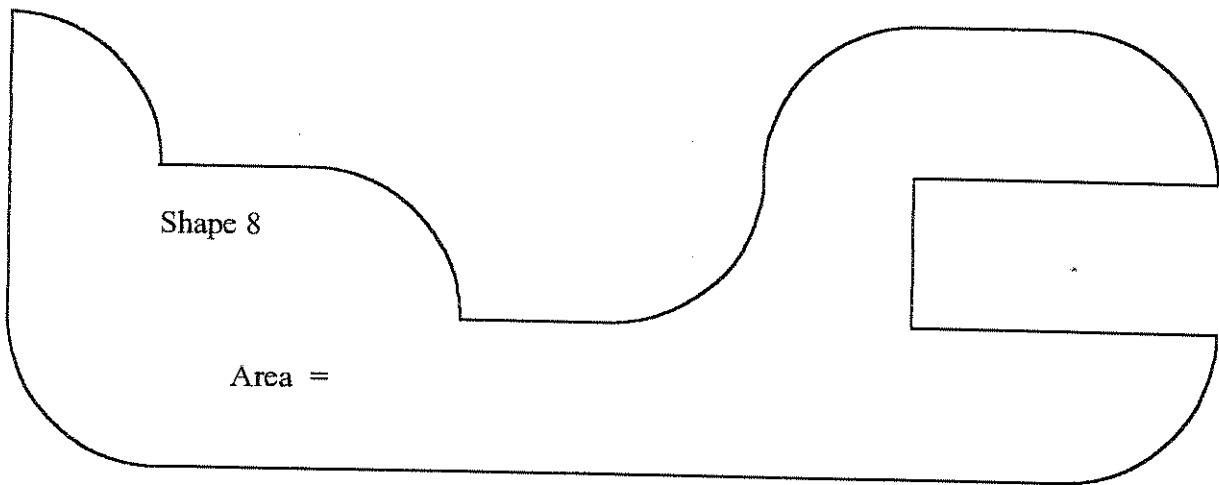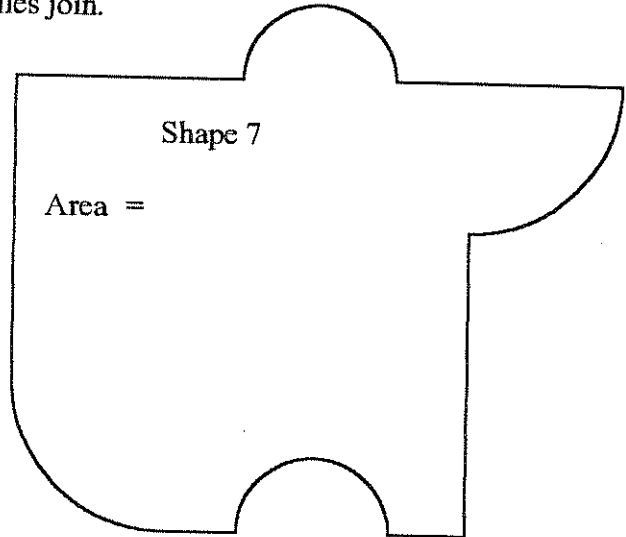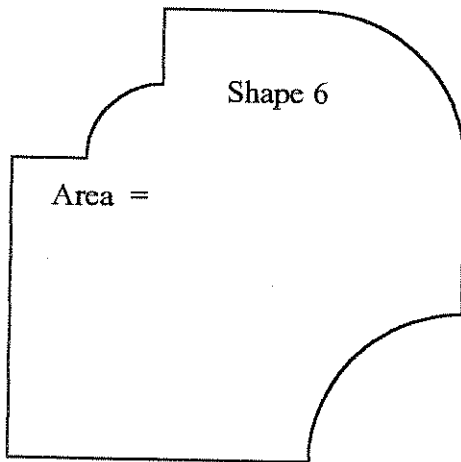(b)   Area of shape =

              =

              =

Did you get the same answer?

Sheet C5   **Four More Shapes**

Make up these four shapes with TakTiles, first drawing light pencil lines to show the squares and quadrants. Draw heavy lines to show where the tiles join.

Shape 6

Area =

Shape 7

Area =

Shape 8

Area =

Find the area of each shape in terms of x and y.

Use the first method in the diagram above, and then use the second method below.

Area of: Shape 6 =   Shape 7 =   Shape 8 =

=   =   =
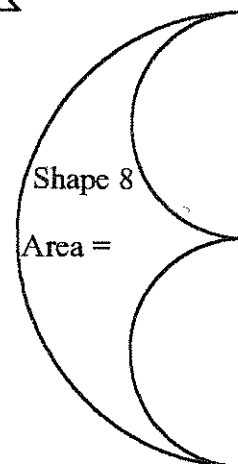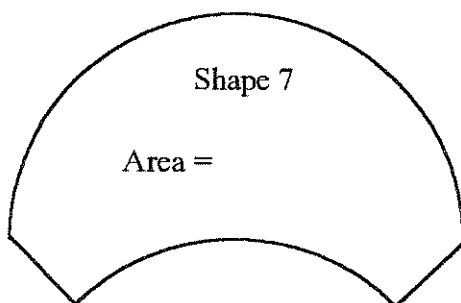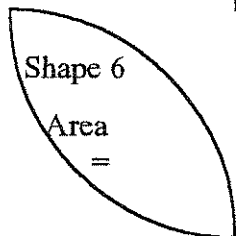
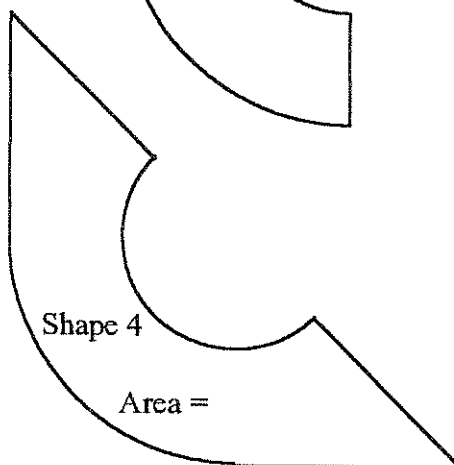=   =   =

Were the answers you got using each method the same?

Sheet C6   # Tricky Shapes

Here are some more difficult shapes
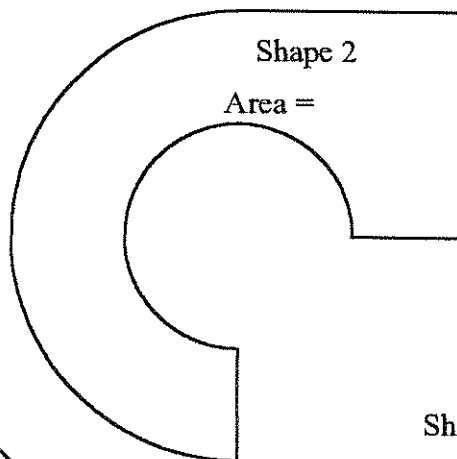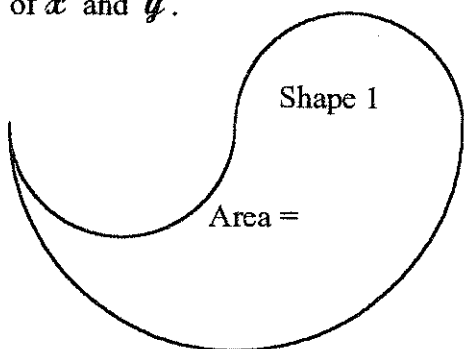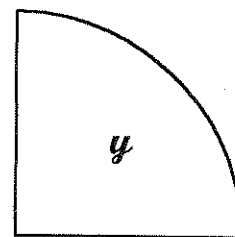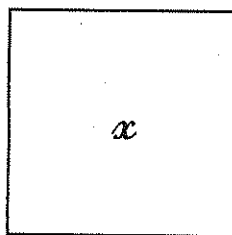that <u>cannot</u> be made using the tiles.
Choose one that looks easy, and find
its area in terms of x and y.

Now try the other ones.

All their areas can be expressed in terms
of x and y.

x

y

Shape 1

Area =

Shape 2

Area =

Shape 3

Area =

Shape 5

Area =

Shape 4

Area =

Shape 6

Area
=

Shape 7
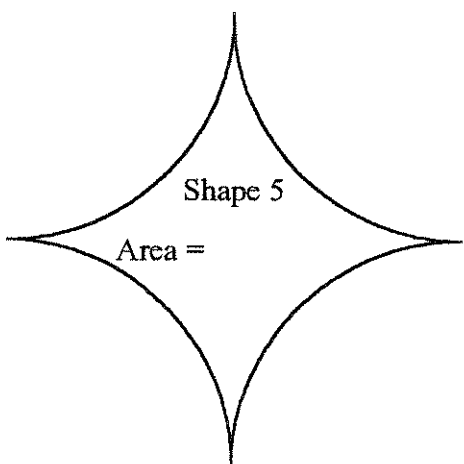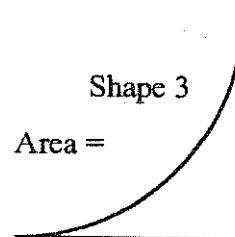
Area =

Shape 8

Area =

ALGEBRA THROUGH GEOMETRY

NAME(S): ....**CLASS:** ....

Each square is the same size as the shape named *x*.
The sheet can help you work out the area of each shape.
You might trace the shapes and then remove them to work out the area.