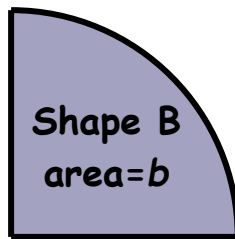
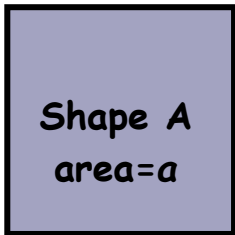


Introducing Tak Tiles

Tak Tiles were originally designed by Geoff Giles, DIME Projects, and this document was originally freely available through the Lancashire Grid for Learning web site. This version includes small edits of the original and is freely distributed through Mathematics Centre (mathematicscentre.com).

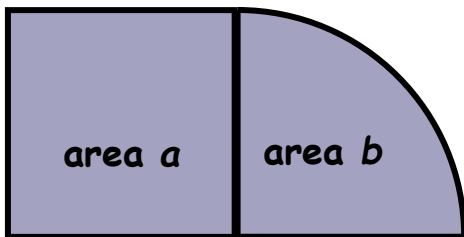
If



This has an area of a

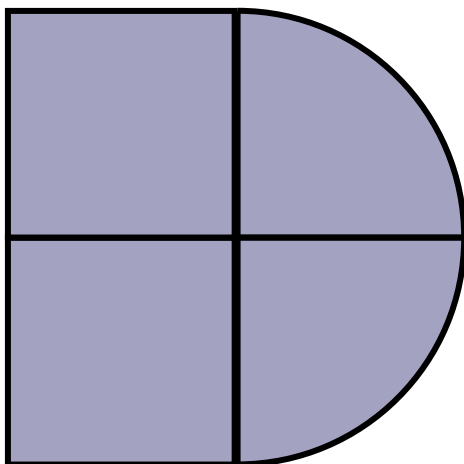
and this has an area of b

Then this shape...



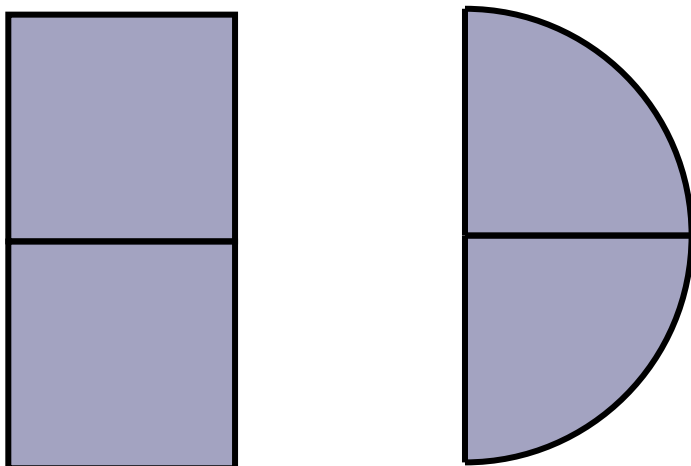
Must have an area of $a + b$.

Think about this shape:



The area of this shape can be thought about in two different ways...

Either

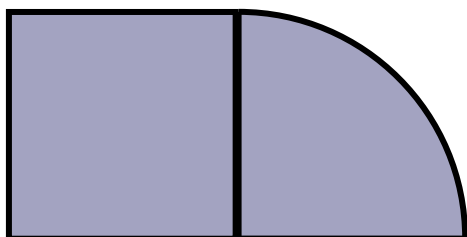


$2a$

+

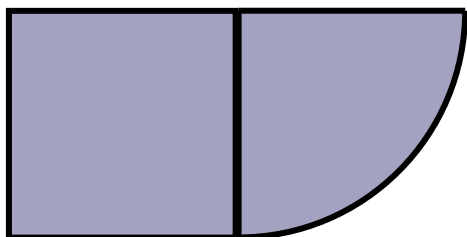
$2b$

or



$(a + b)$

+



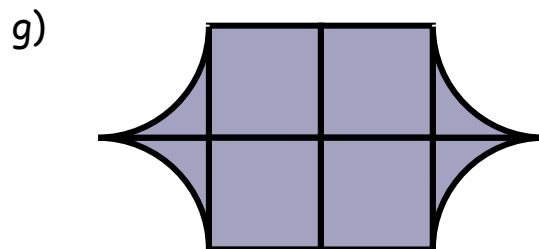
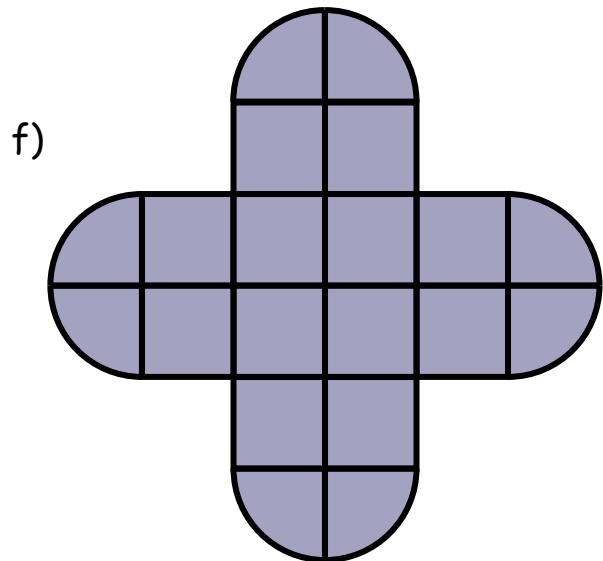
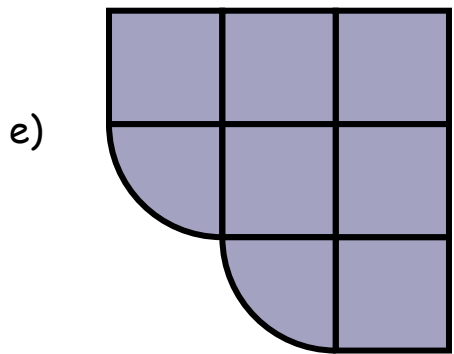
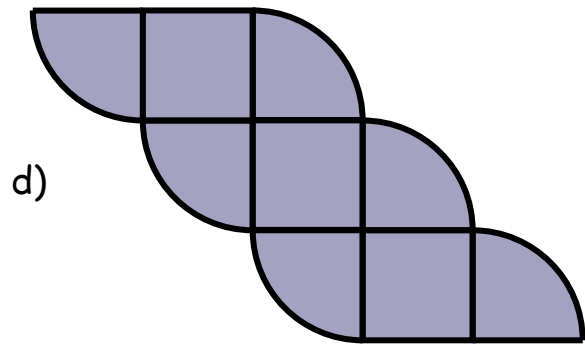
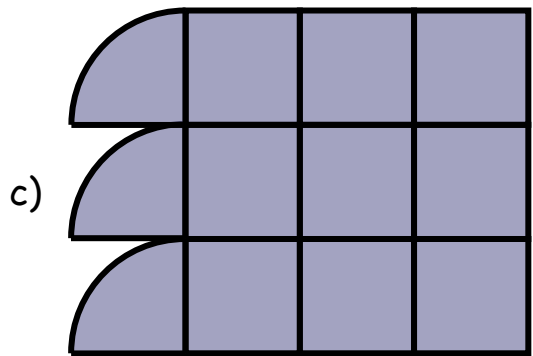
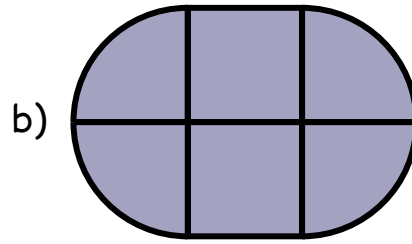
$(a + b)$

Which is $2(a + b)$

As these areas are the same we know that

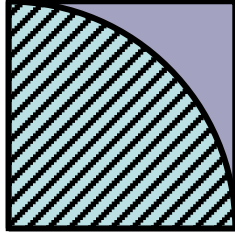
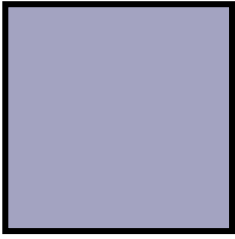
$$2a + 2b = 2(a + b)$$

How many ways can you find to write the areas of these shapes?



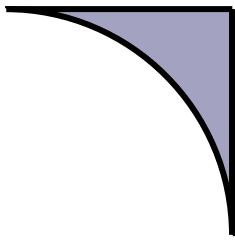
How did you manage with shape g?

Think of this:



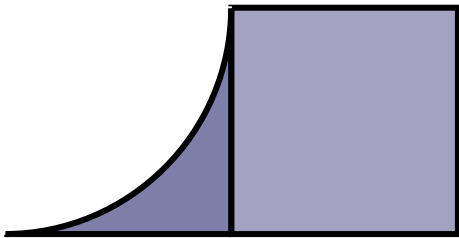
This has area a
Then...

but if I cut off the shaded area b



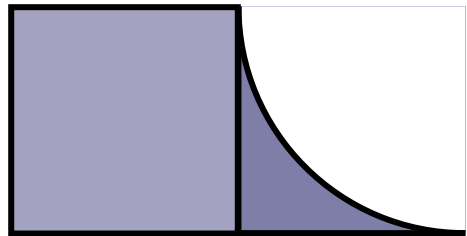
This has an area of $a - b$

So the area of g is:



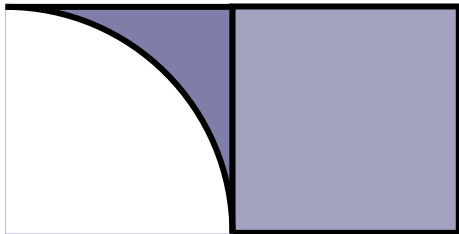
$$(a - b) + a$$

$$2a - b$$

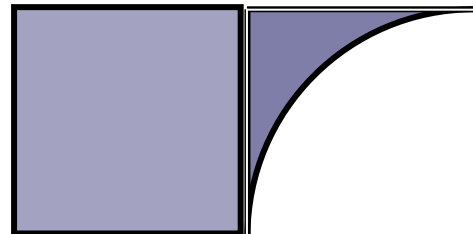


$$2a + b$$

+



$$2a - b$$



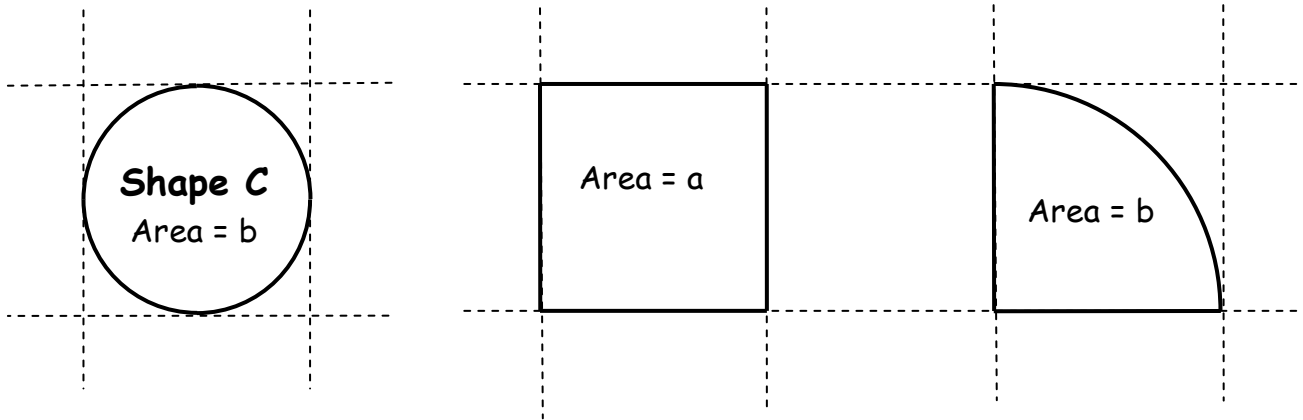
$$2a + b$$

+

So $8a - 4b$ or $4(2a - b)$

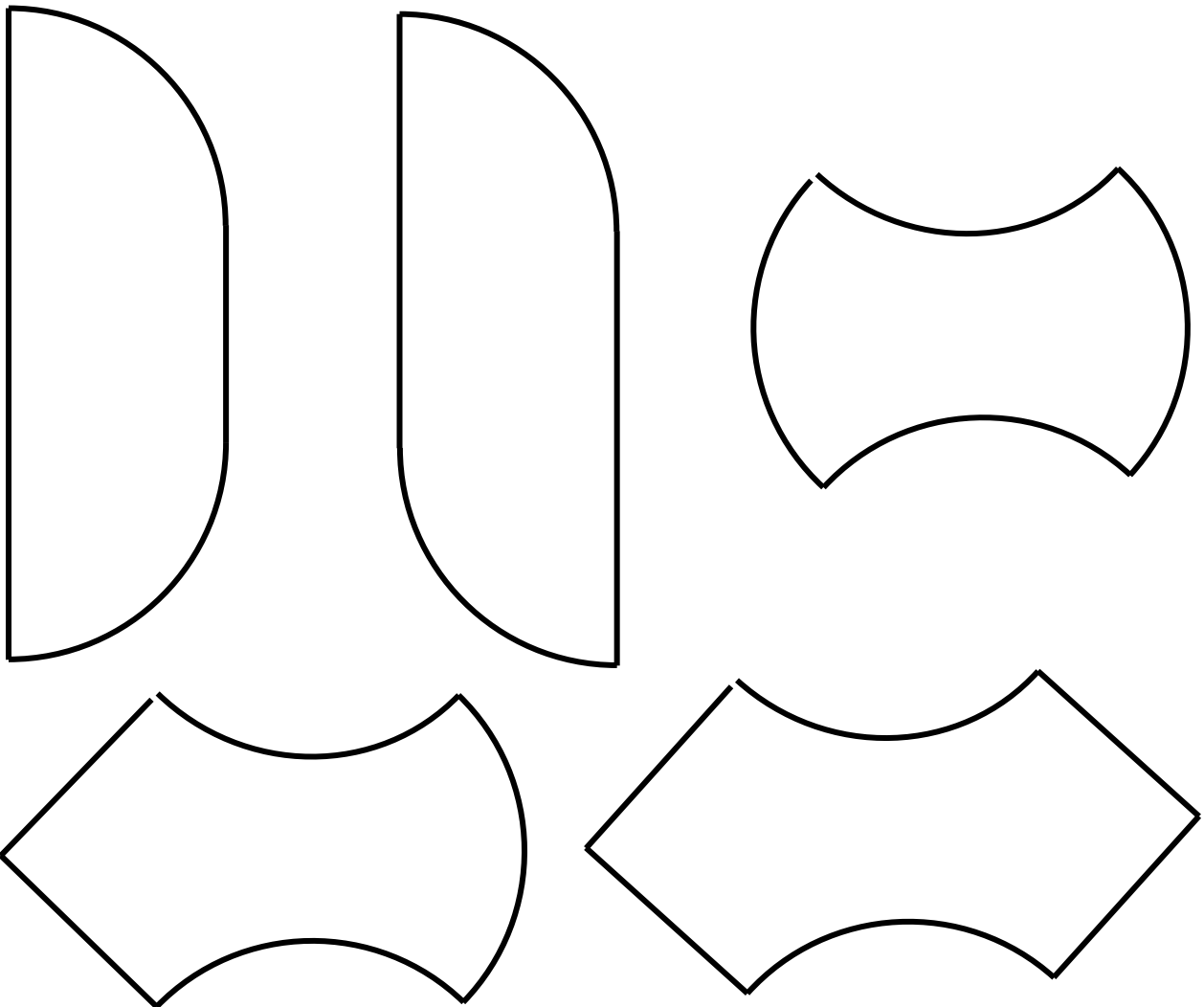
A New Area

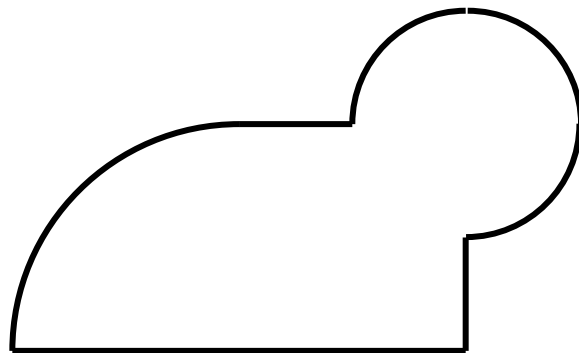
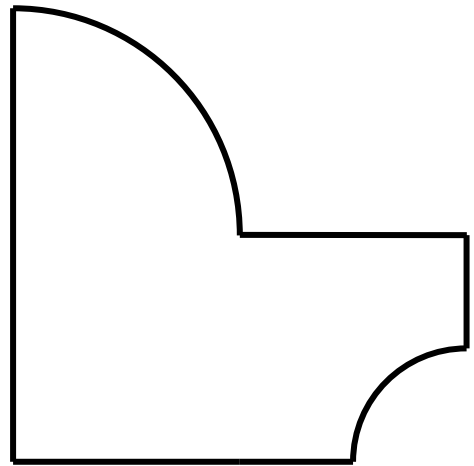
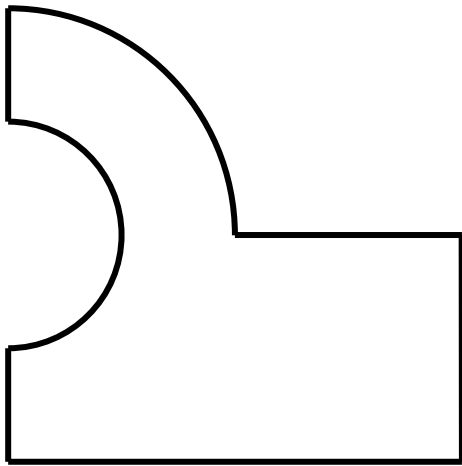
There is another area that you will need for the next problem:



So we now have three areas.

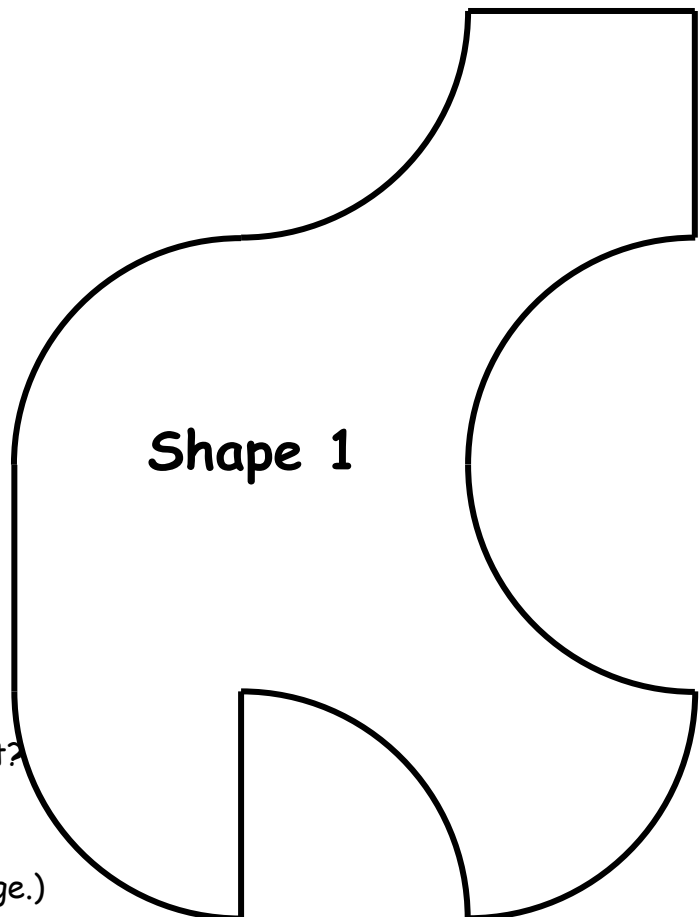
Use them all to work out expressions for each of the 8 Tak Tile shapes:





Adding Expressions

What is the area of Shape 1?



Which Tak Tiles can you use to make it?

What are the areas of the Tak Tiles?

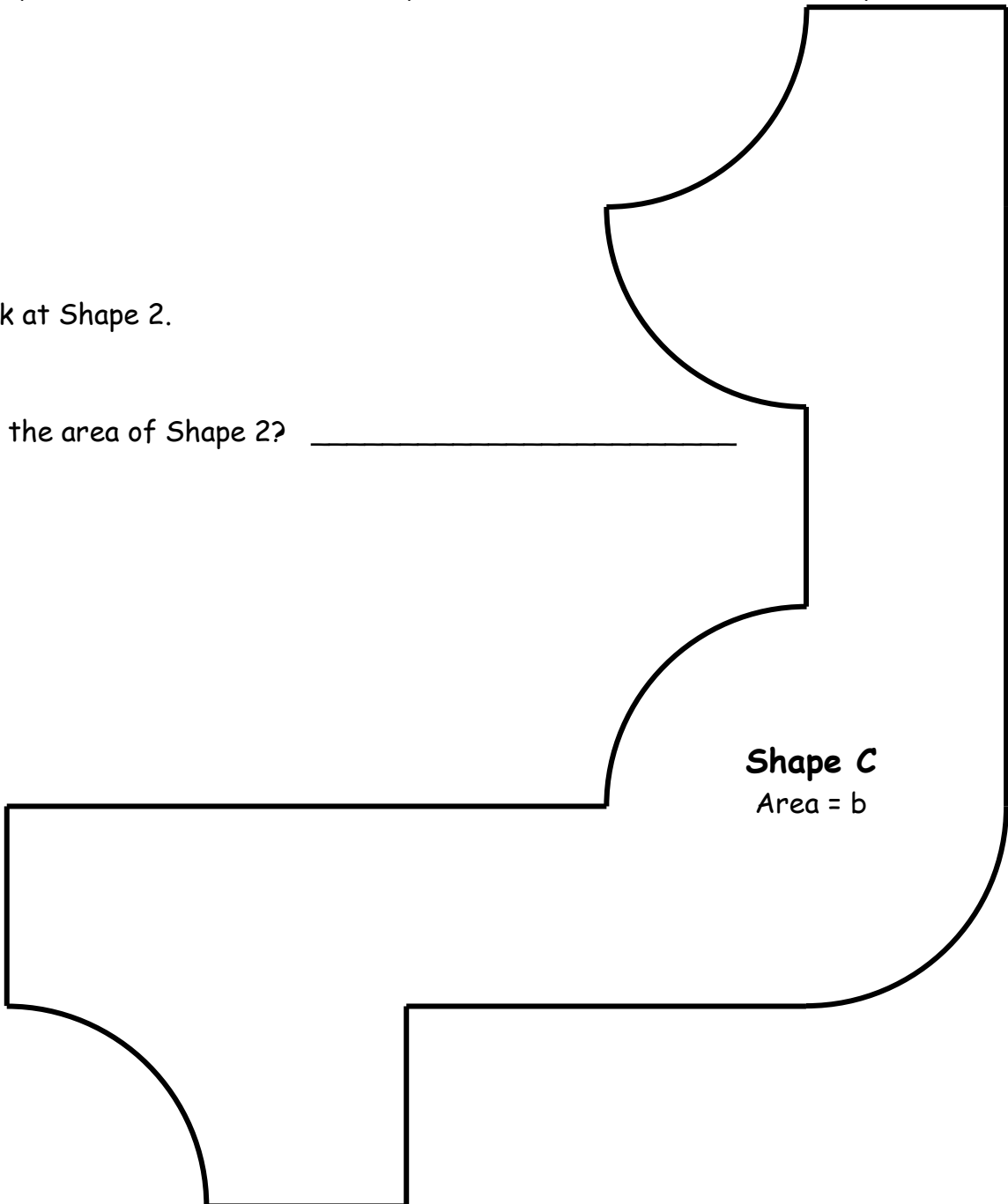
Add them together. (Table on next page.)

Tak Tiles		Area
Total		

What do you notice about the total of your Tak Tiles and the area of Shape 1?

Now look at Shape 2.

What is the area of Shape 2? _____



Again work out which Tak Tiles you need to make Shape 2 and list them together with their areas. (Table on next page.)

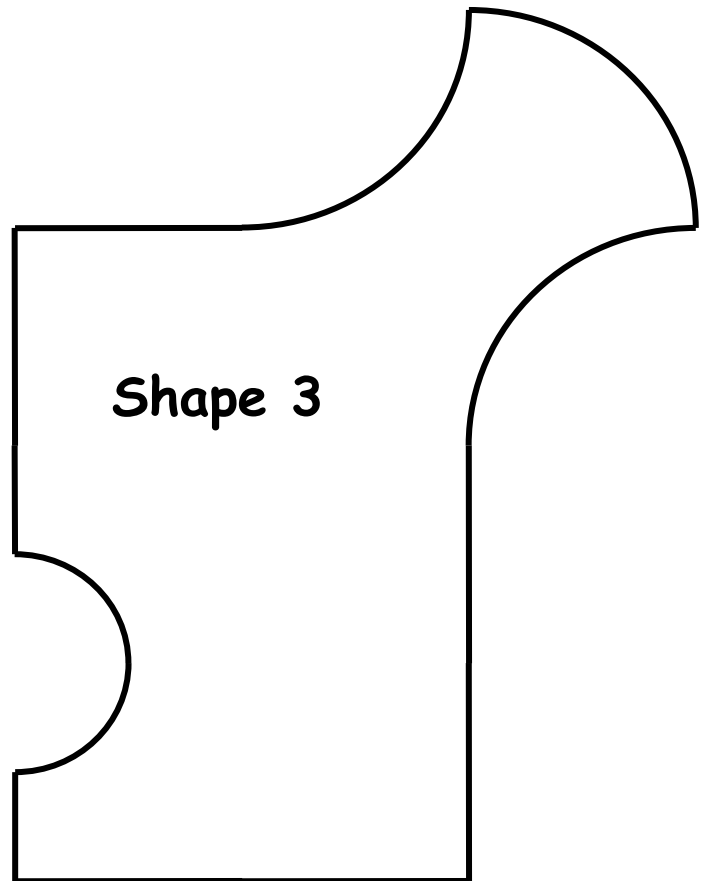
Tak tiles		Area
Total		

Can you make Shape 3?

The area of Shape 3 is:

Which shapes did you use?

Shape	Area
-------	------



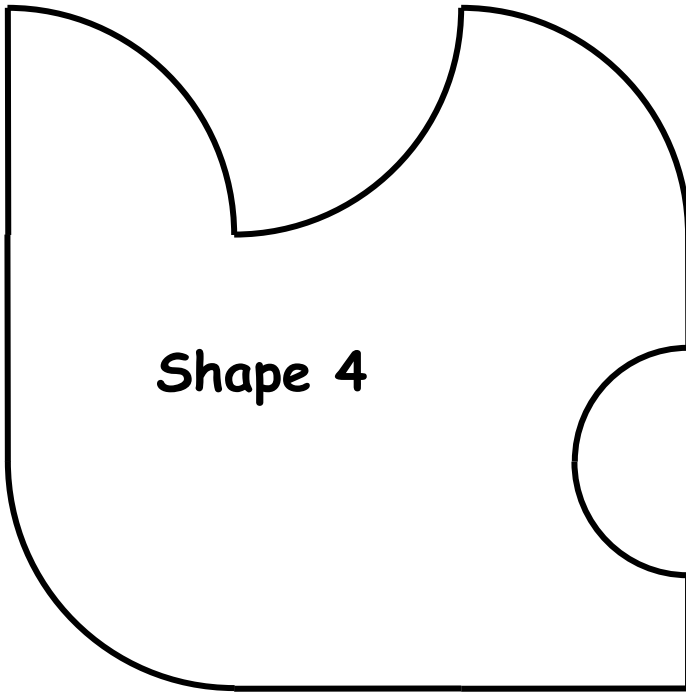
Add up the areas of the individual shapes.

Did you get it right? How do you know?

If you were wrong go back and check your answer.

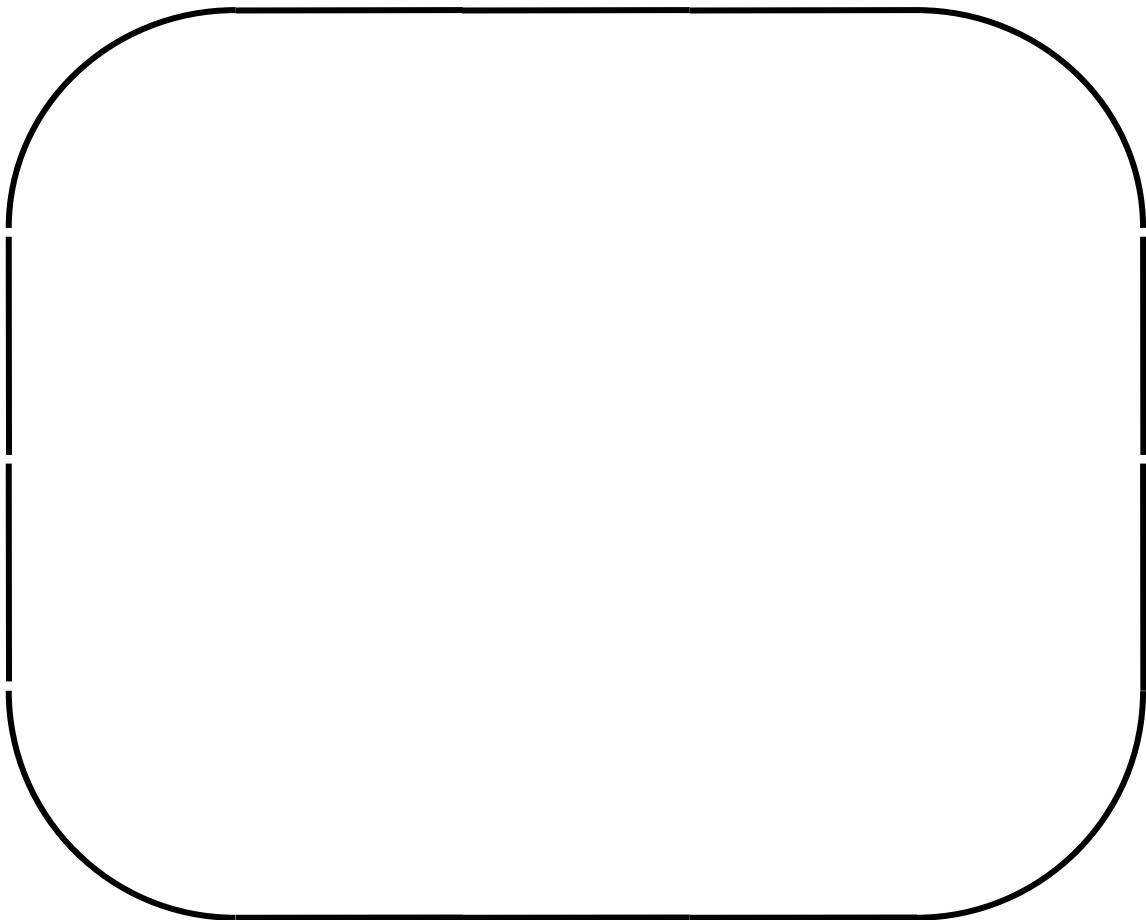
Now do the same thing for Shape 4.

Working Space:



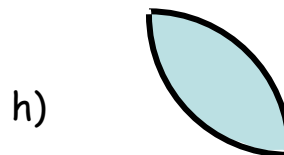
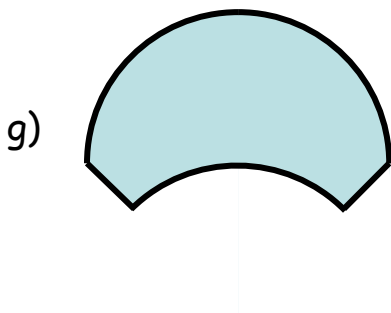
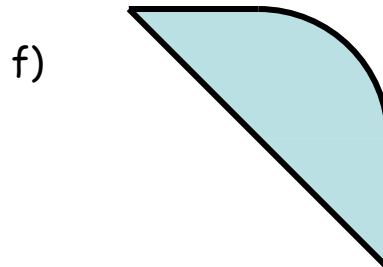
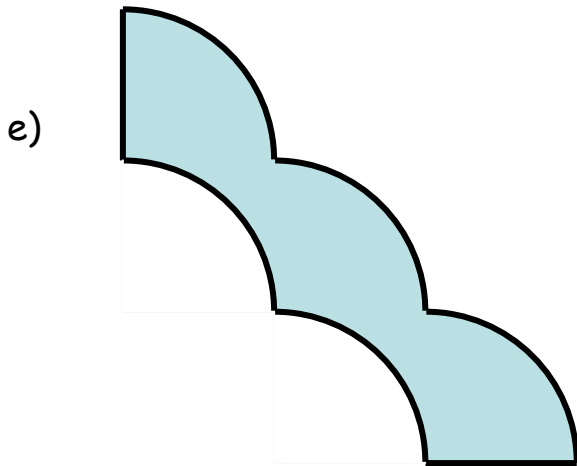
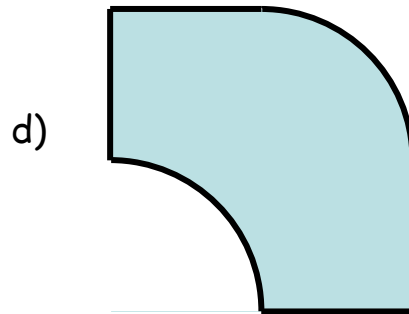
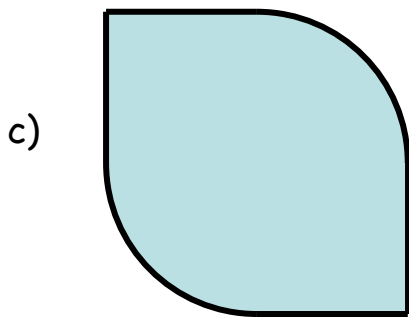
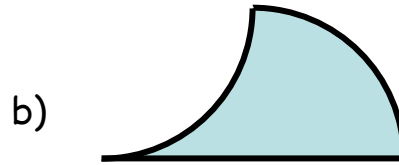
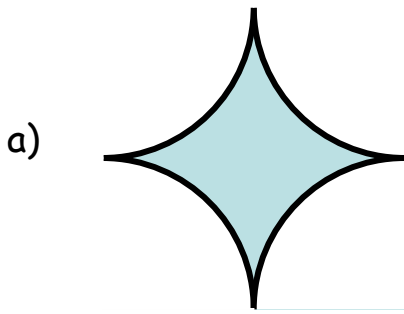
All the shapes!

All the Tak Tile shapes will fit together into this shape:



Add up the areas of all the shapes. Did you get it right!!

Now try these - remember to think about how many different ways there are of writing these shapes.



This may be the smallest but it's probably the hardest!