Picture Puzzles

ALGEBRA THROUGH GEOMETRY

Picture Puzzles

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Creator ... Doug. Williams
Publisher ... Mathematics Centre

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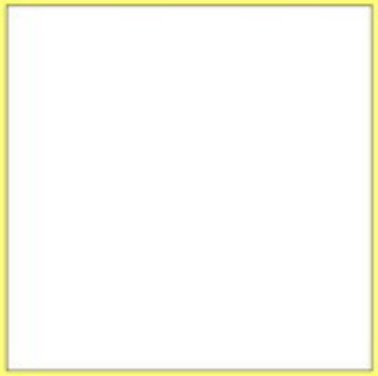
This Picture Puzzle is based on
... Task 71, Algebra Through Geometry
Teaching Notes
... mathematicscentre.com/taskcentre/071algeb.htm

STARTING OUT

Square ... Shape X



STARTING OUT

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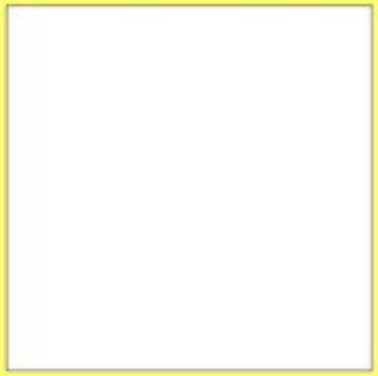
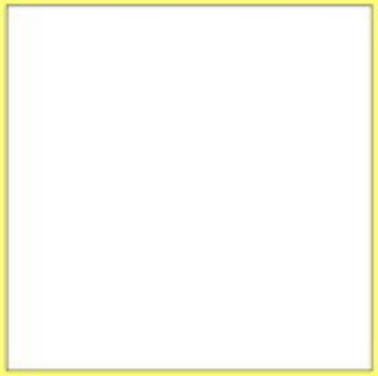


What can we say about its area?

STARTING OUT

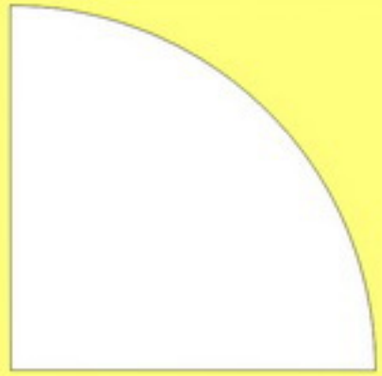
Square ... Shape X



X has an area.
We don't know the
value of its area.
We will use x to
stand for its area.

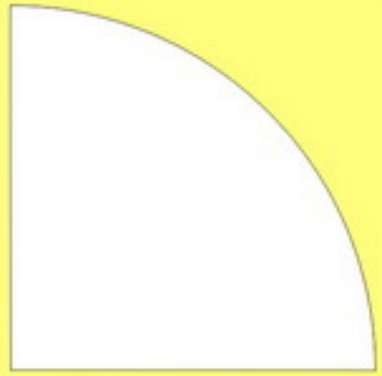
ADDING INTEREST

Quadrant ... Shape Y



ADDING INTEREST

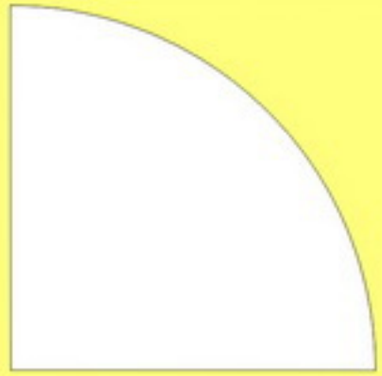
Quadrant ... Shape Y



What can we say about its area?

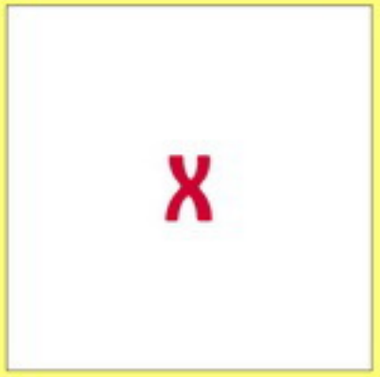
ADDING INTEREST

Quadrant ... Shape Y

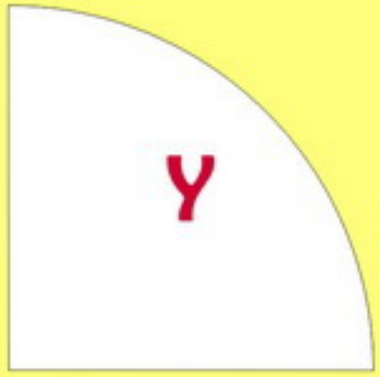


Y has an area.
We don't know the
value of its area.
We will use y to
stand for its area.

KNOWN UNKNOWNS



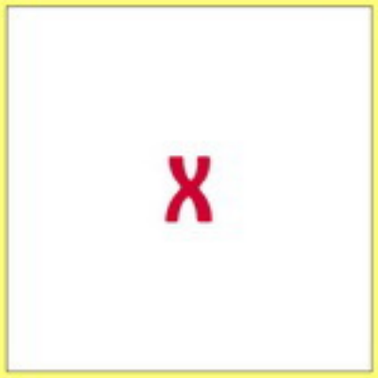
Area = x



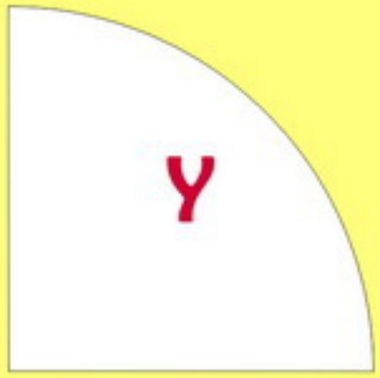
Area = y

Use X to draw a shape with area = 2x
How many solutions are there?

KNOWN UNKNOWNS



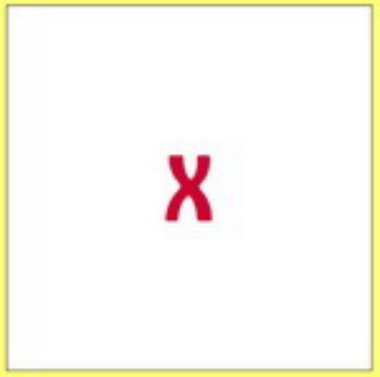
Area = x



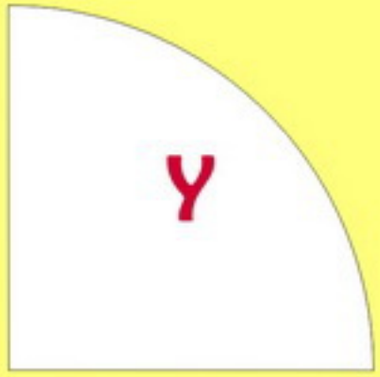
Area = y

Use X to draw a shape with area = 3x
How many solutions are there?
How do you know when you have found them all?

KNOWN UNKNOWNS



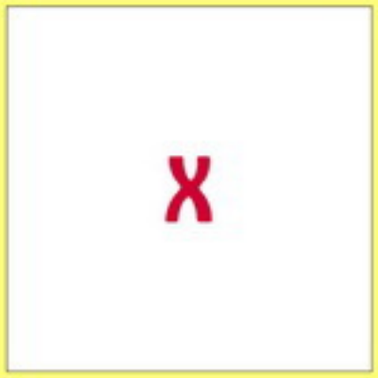
Area = x



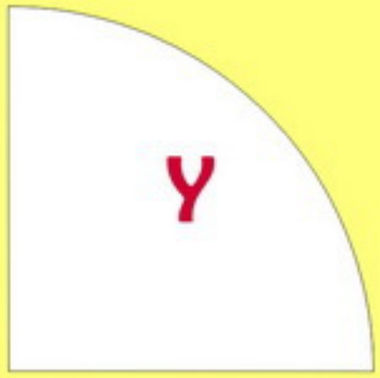
Area = y

Use Y to draw a shape with area = 2y
How many solutions are there?

KNOWN UNKNOWNS



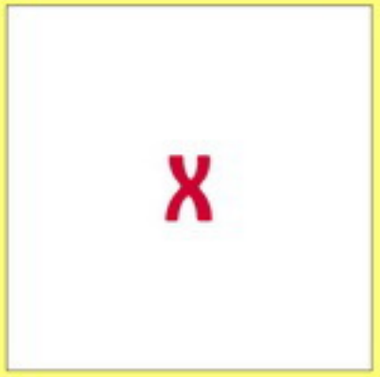
Area = x



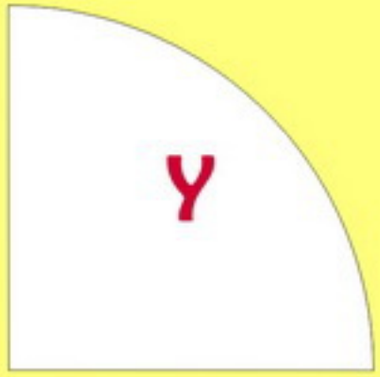
Area = y

Use Y to draw a shape with area = 3y
How many solutions are there?
How do you know when you have found them all?

KNOWN UNKNOWNS



Area = x



Area = y

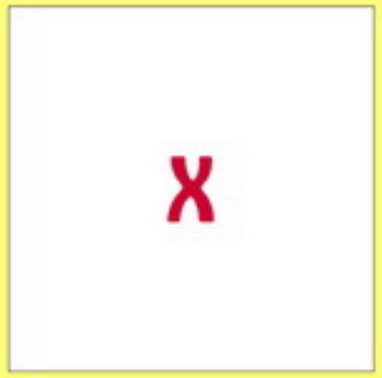
Your Choice

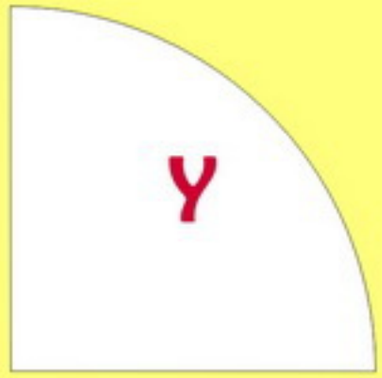
Investigate one or two of these.

Shapes with area 4x or 5x.

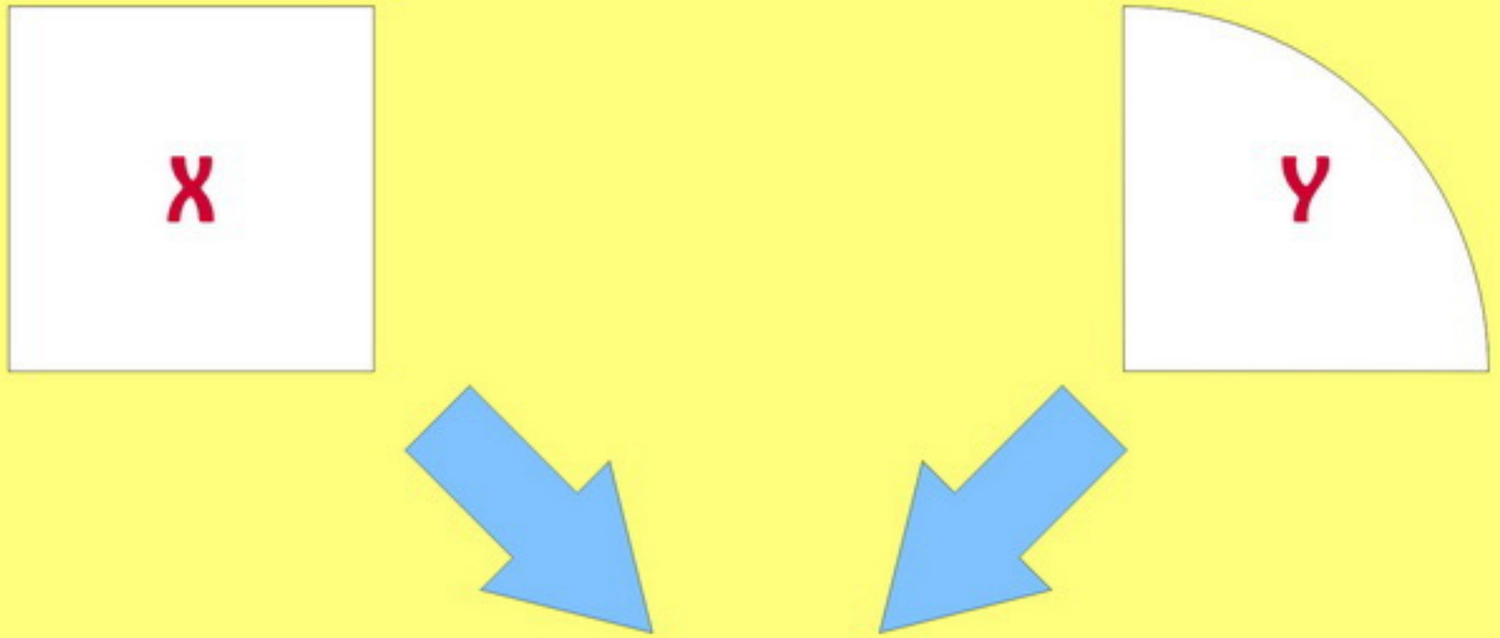
Shapes with area 4y or 5y.

GETTING TOGETHER

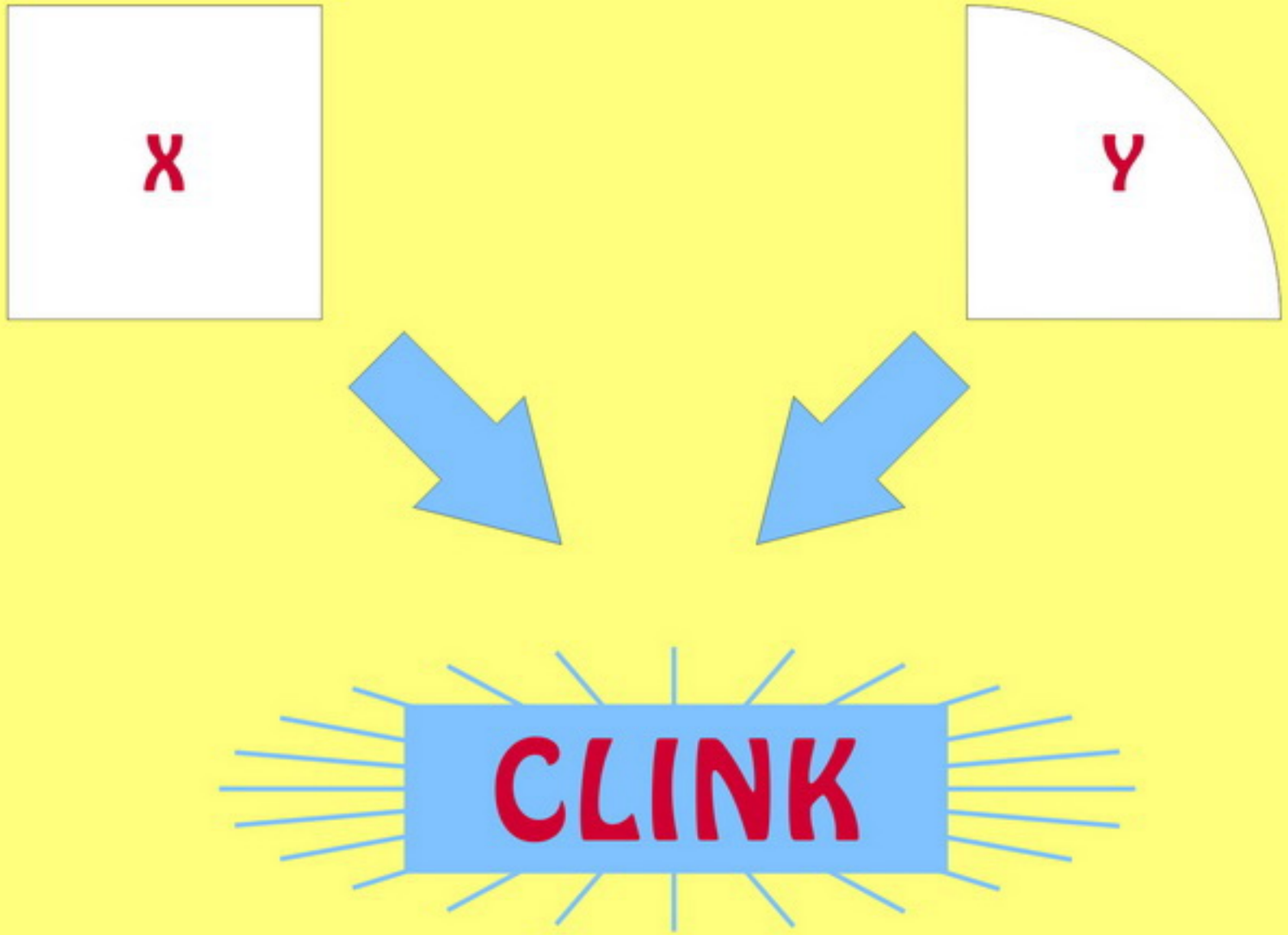




GETTING TOGETHER

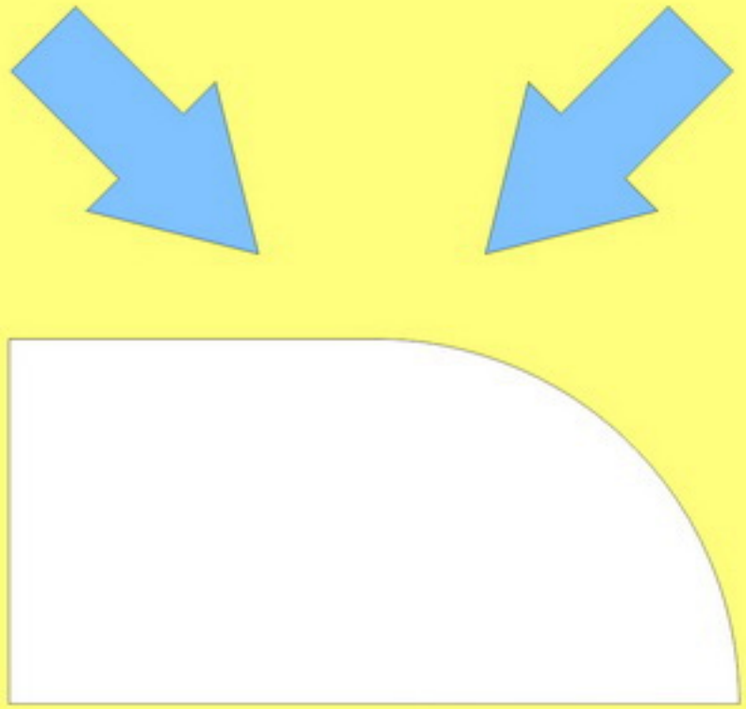


GETTING TOGETHER

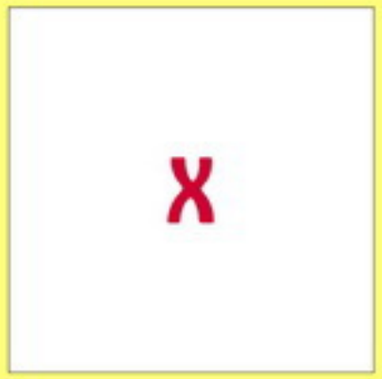


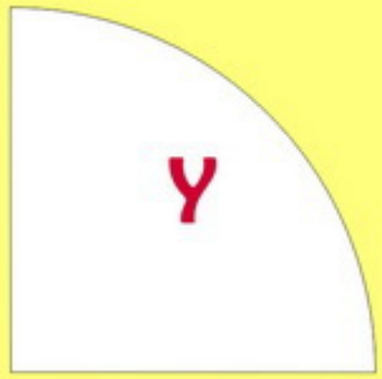
GETTING TOGETHER

Area?



GETTING TOGETHER

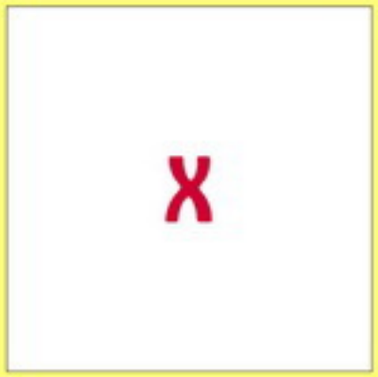


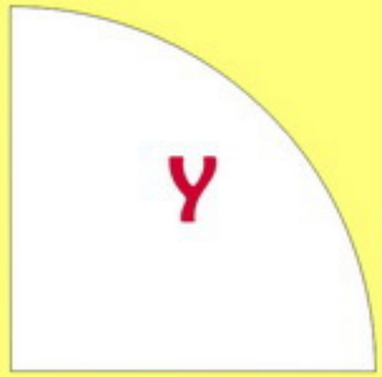


Use Xs and Ys to make 3 interesting shapes.

Record the area of each shape.

BREAKING APART





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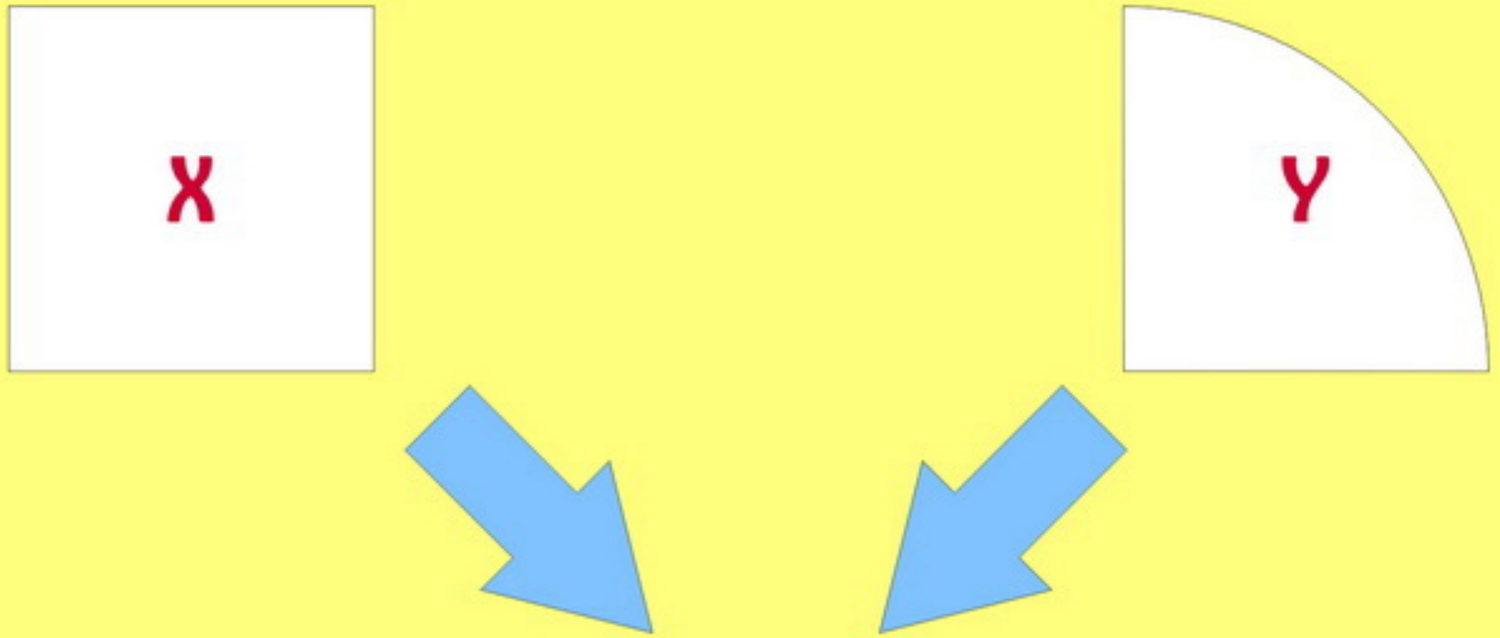

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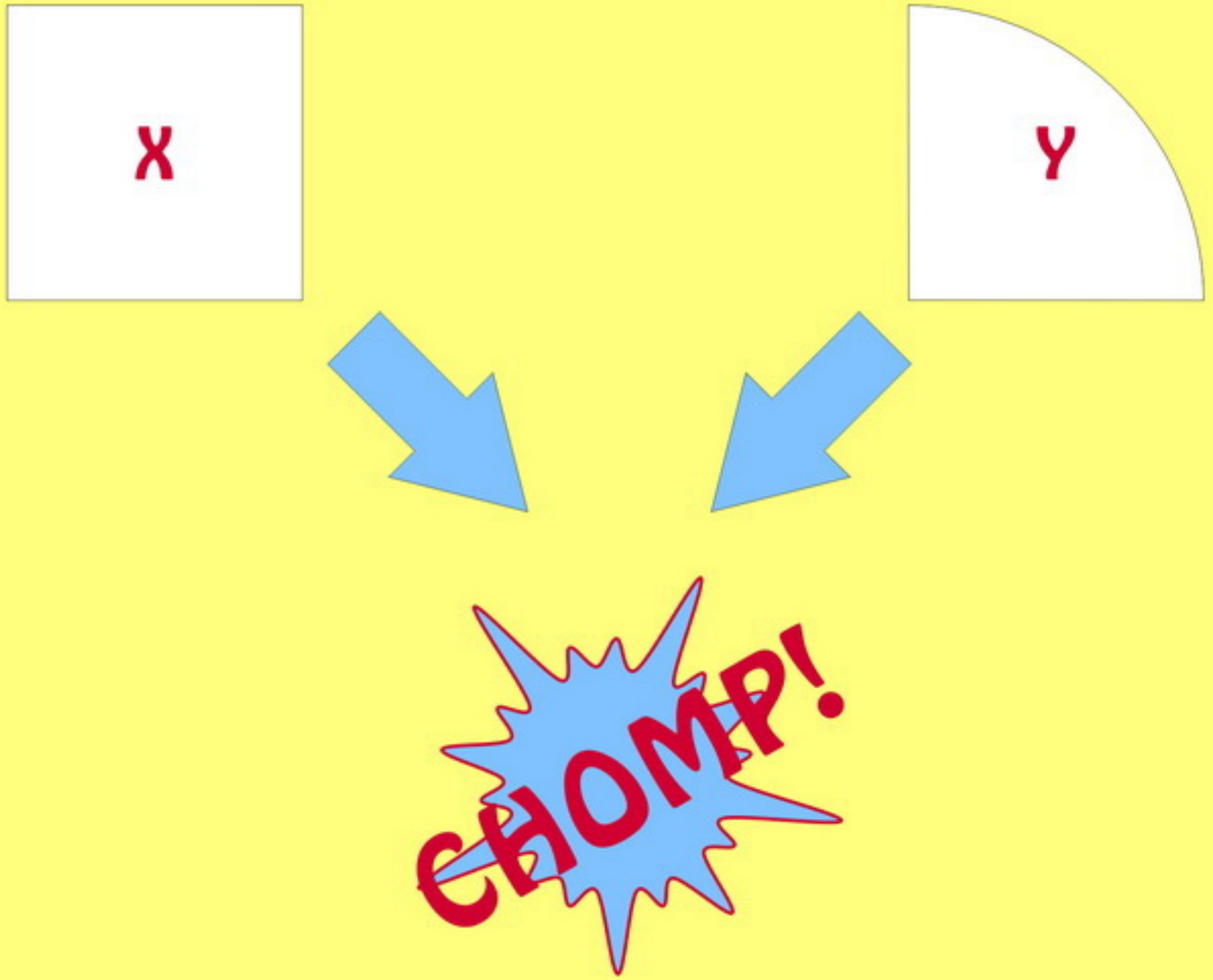
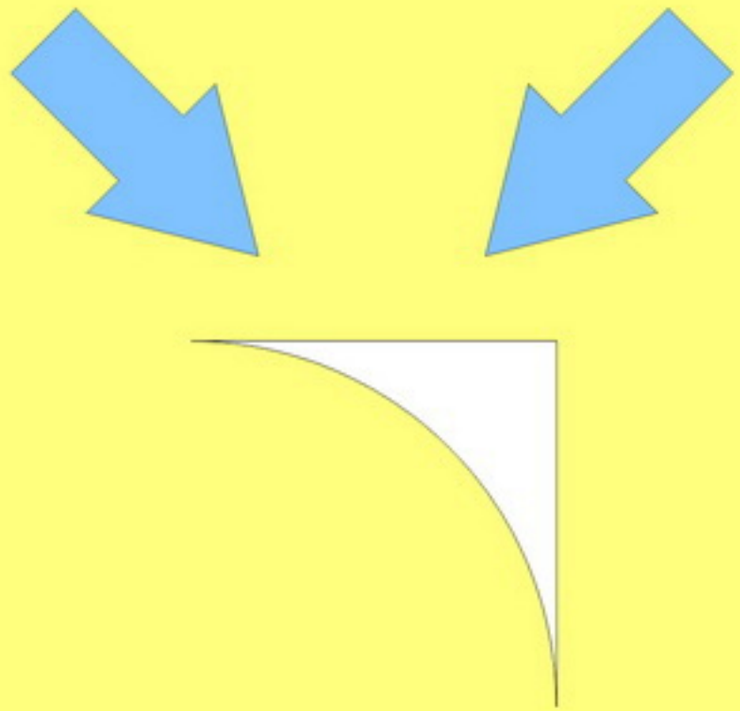


BREAKING APART

Area?



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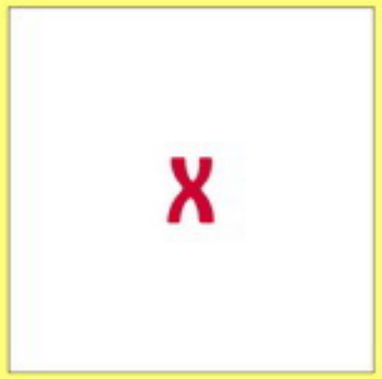
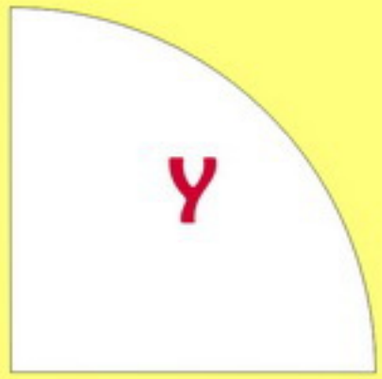
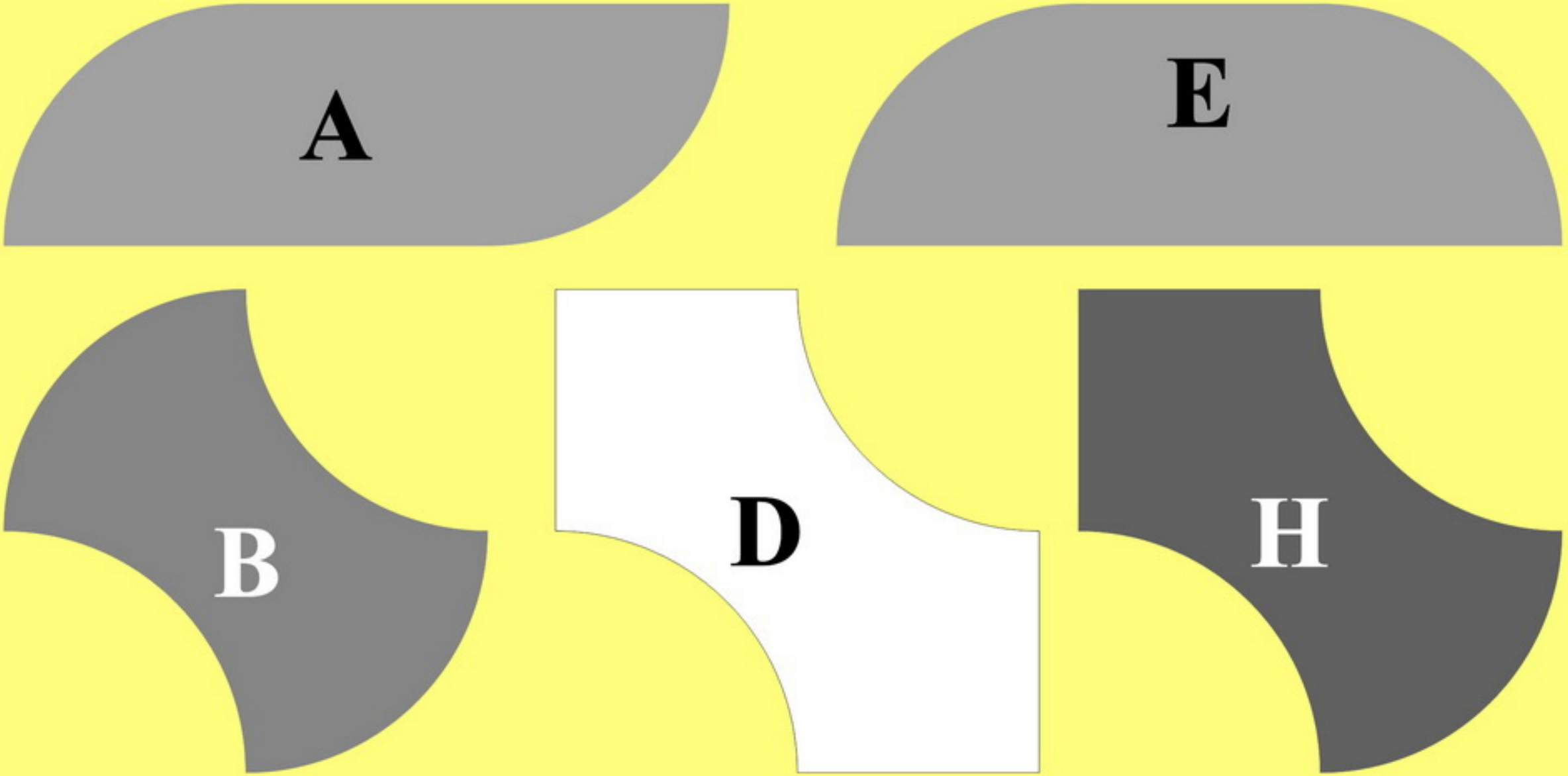




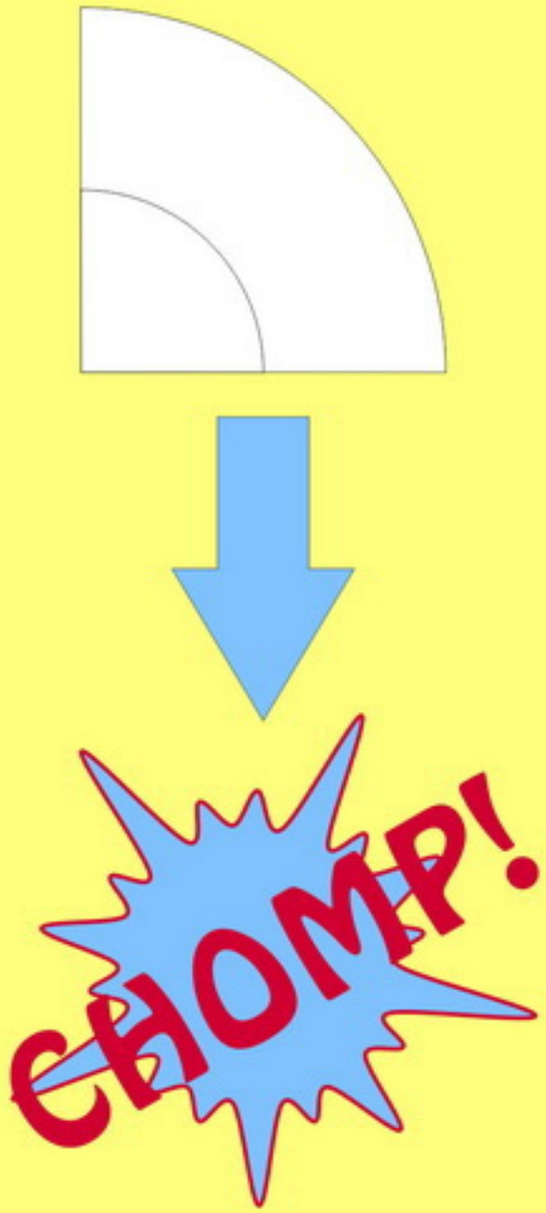
Use Xs and Ys to make 3 interesting shapes.
Each shape must include at least one (x - y) area.
Record the area of each shape.

SHAPES & SIZES



Find the area of each of these TakTiles.
Record.

SHAPES & SIZES



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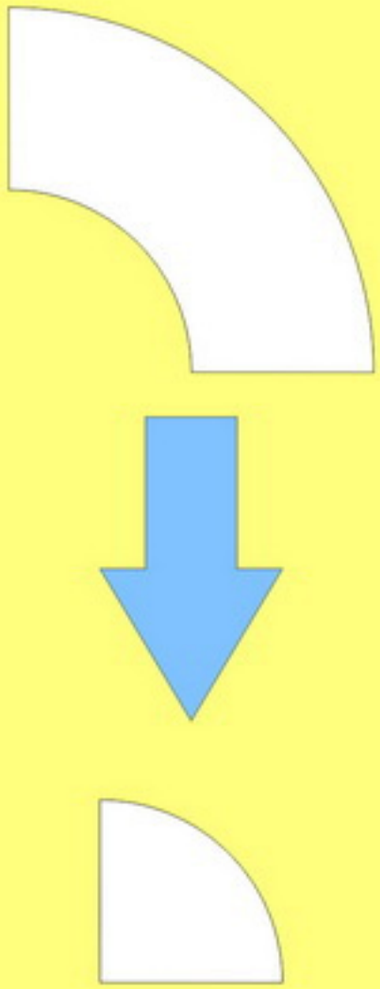
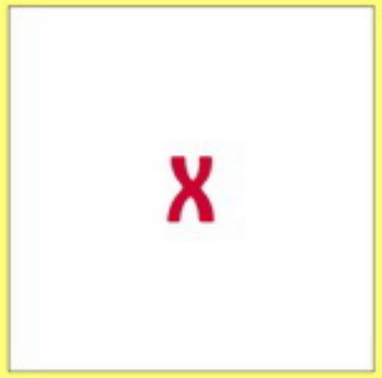
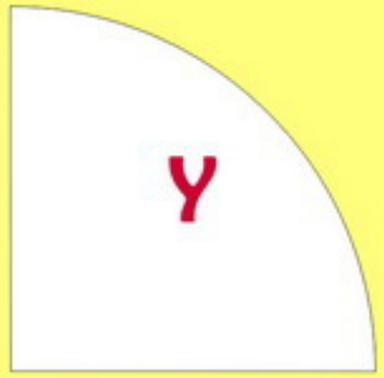


SHAPES & SIZES



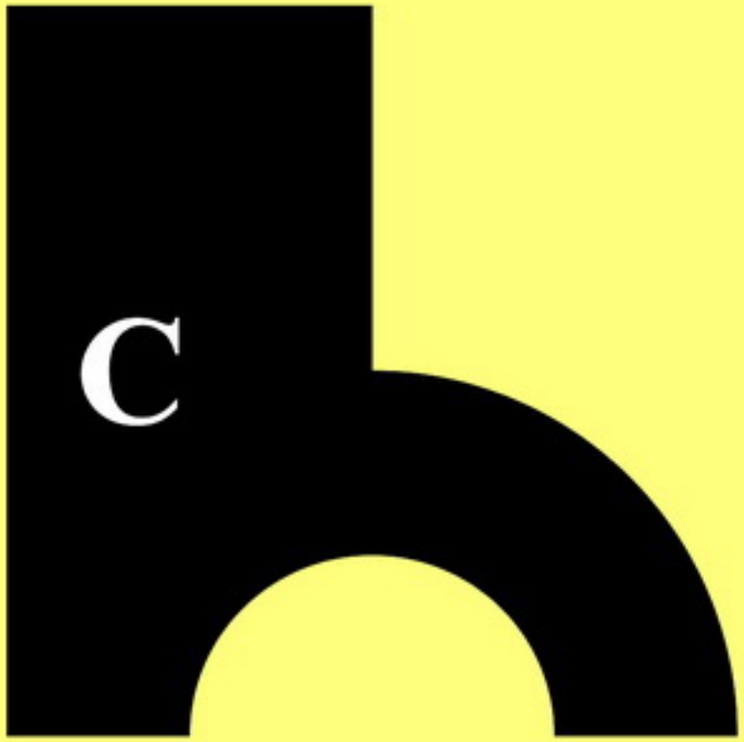
Area = x

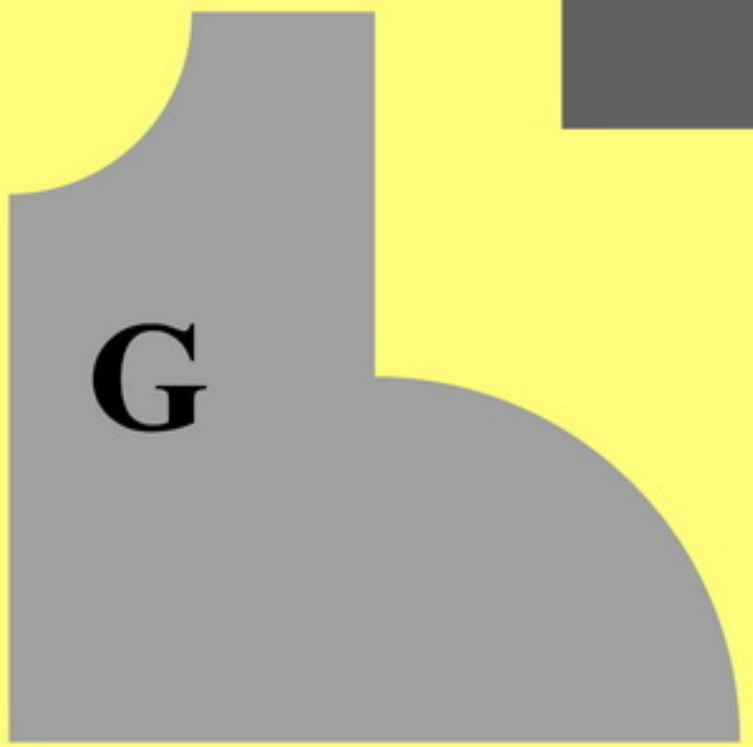
Area = ¼y



Area = y

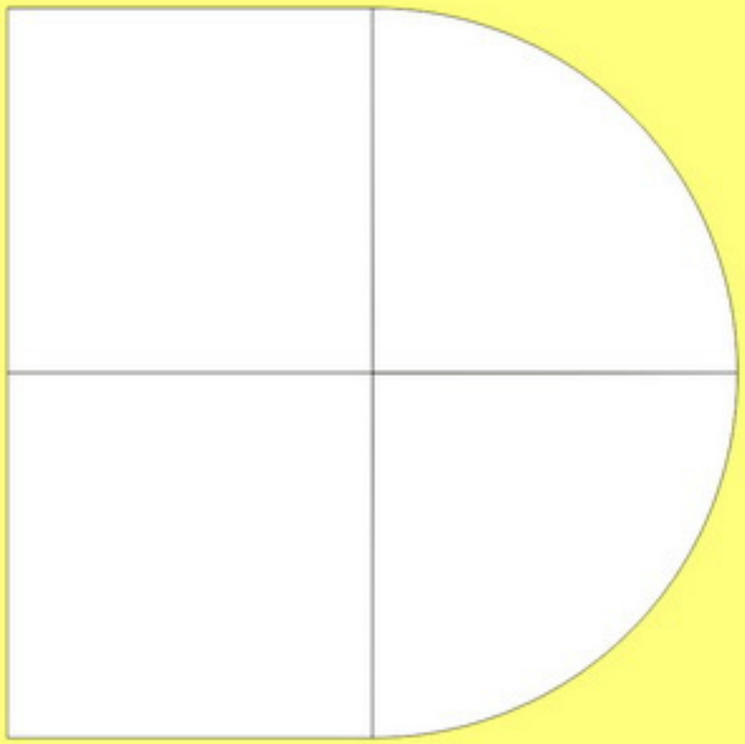
SHAPES & SIZES





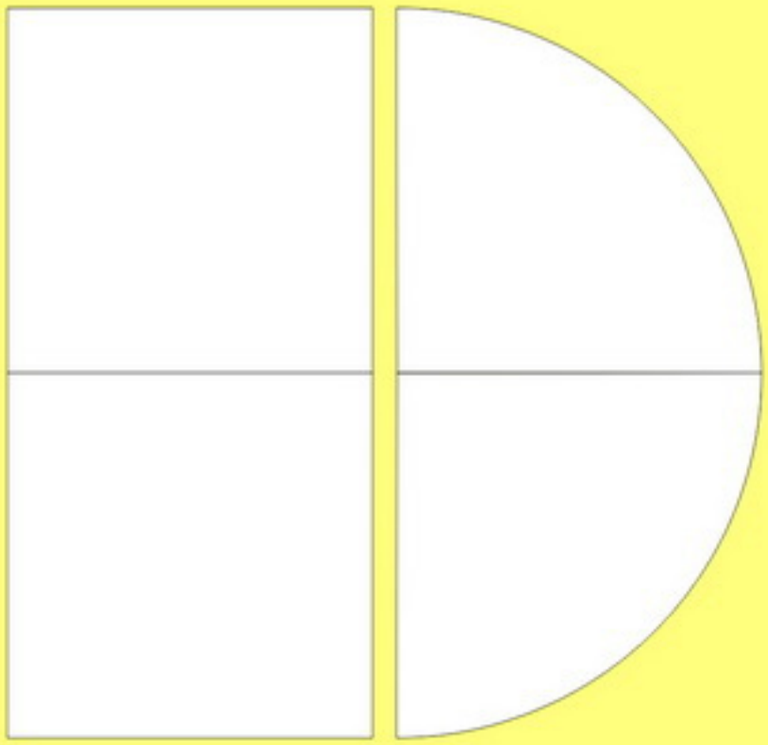
Find the area of each of these TakTiles.
Record.

TWO WAYS

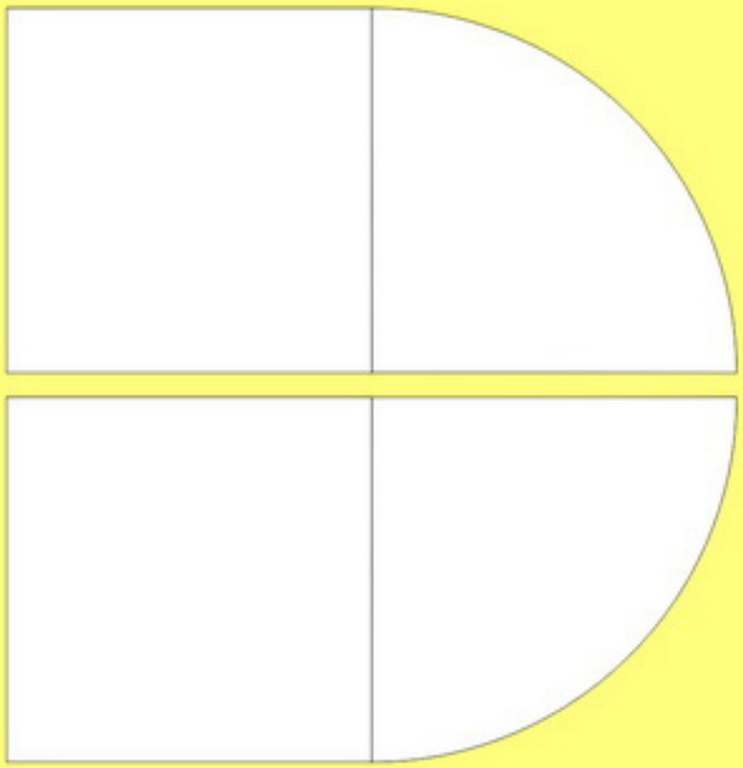


Calculate the area

TWO WAYS



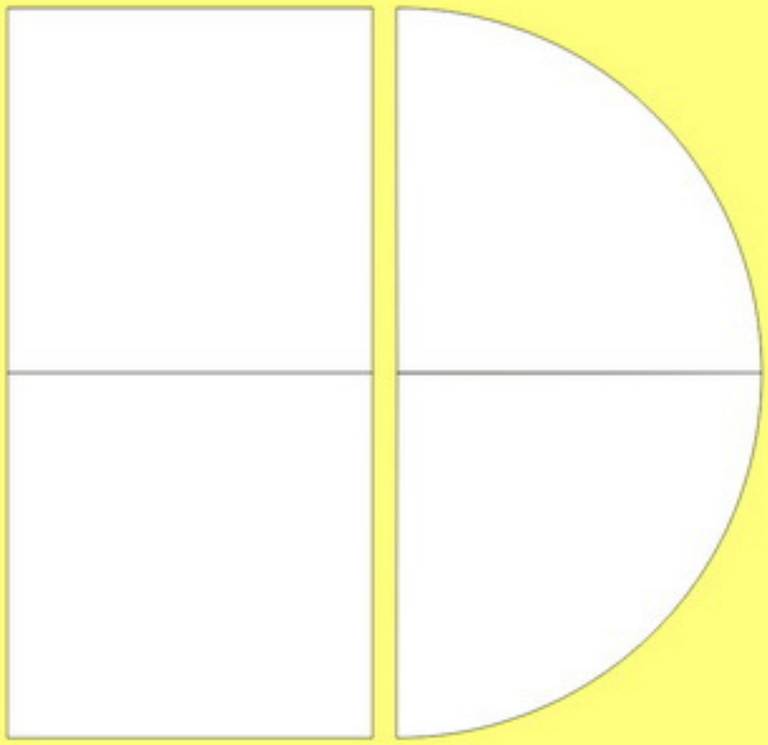
Area = ...



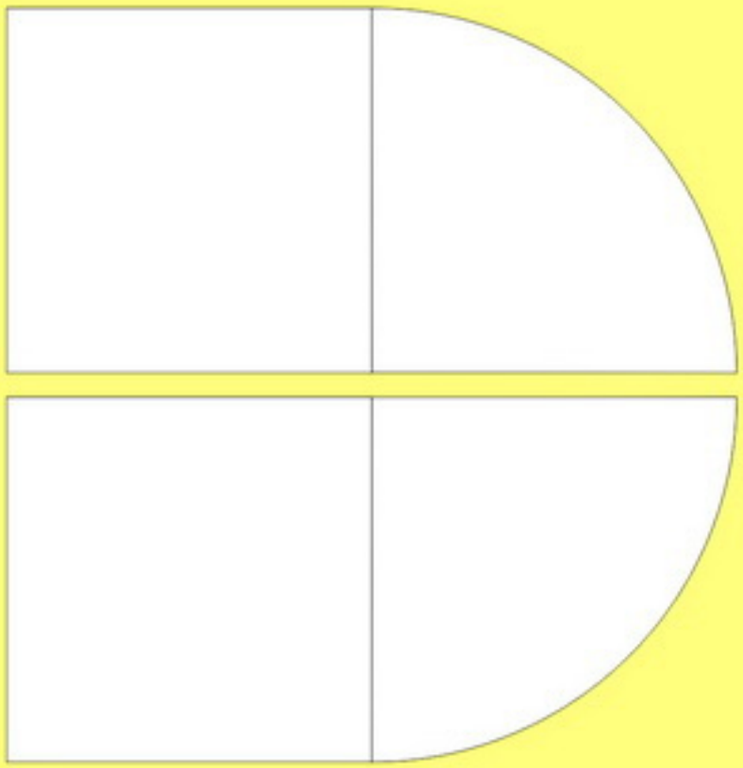
Area = ...

Record

TWO WAYS



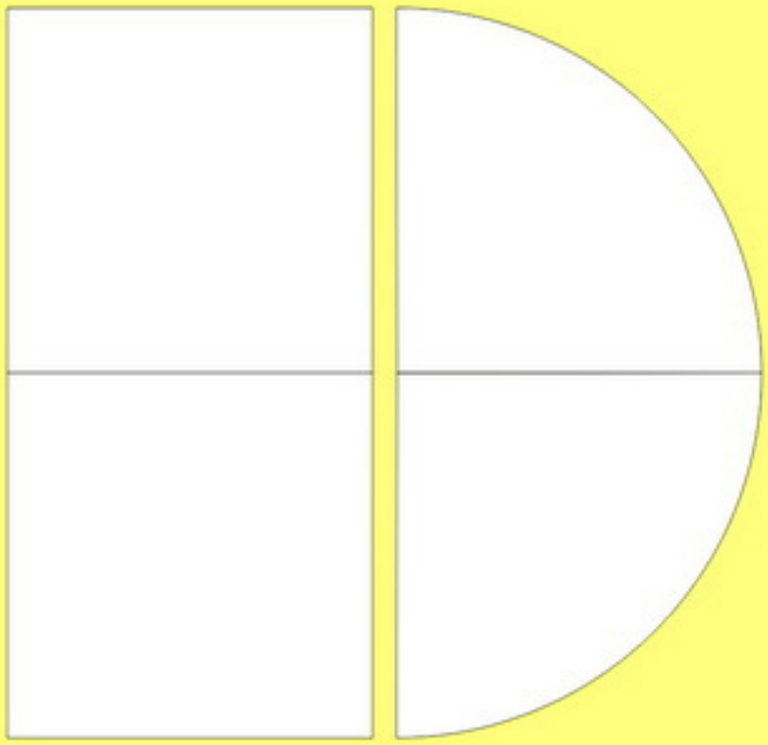
Area = ...



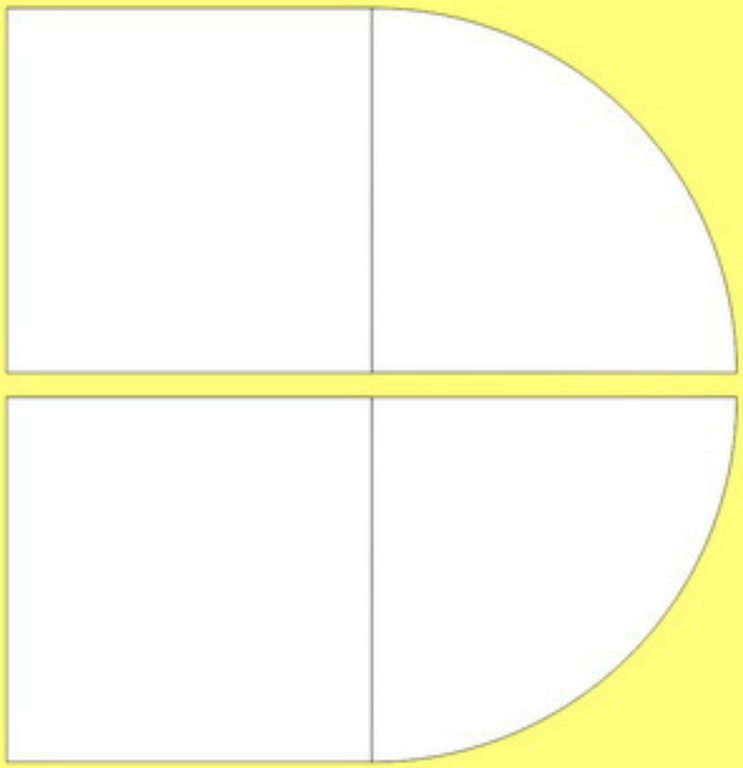
Area = ...

One shape. Two ways to calculate area. So...

TWO WAYS



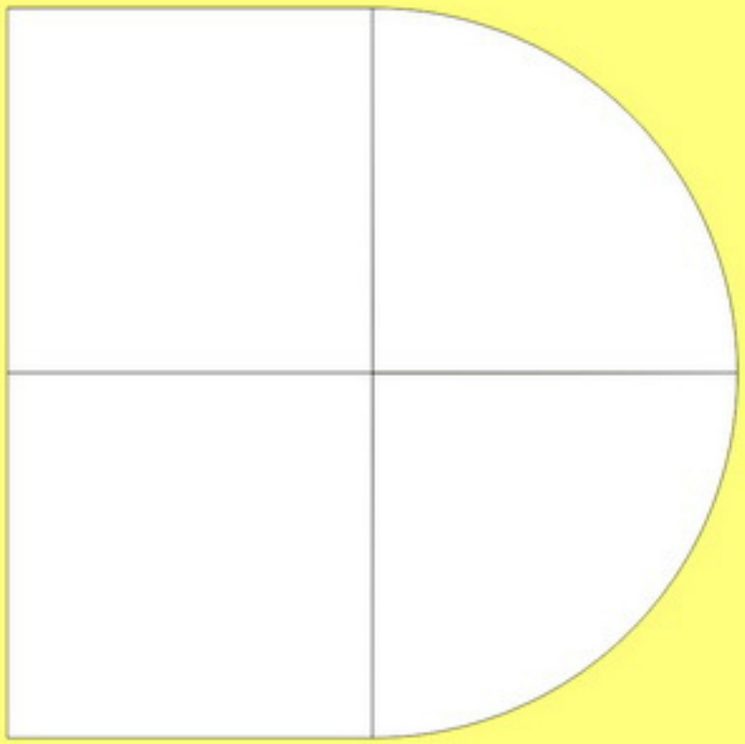
Area = ...



Area = ...

$$2x + 2y = 2(x + y)$$

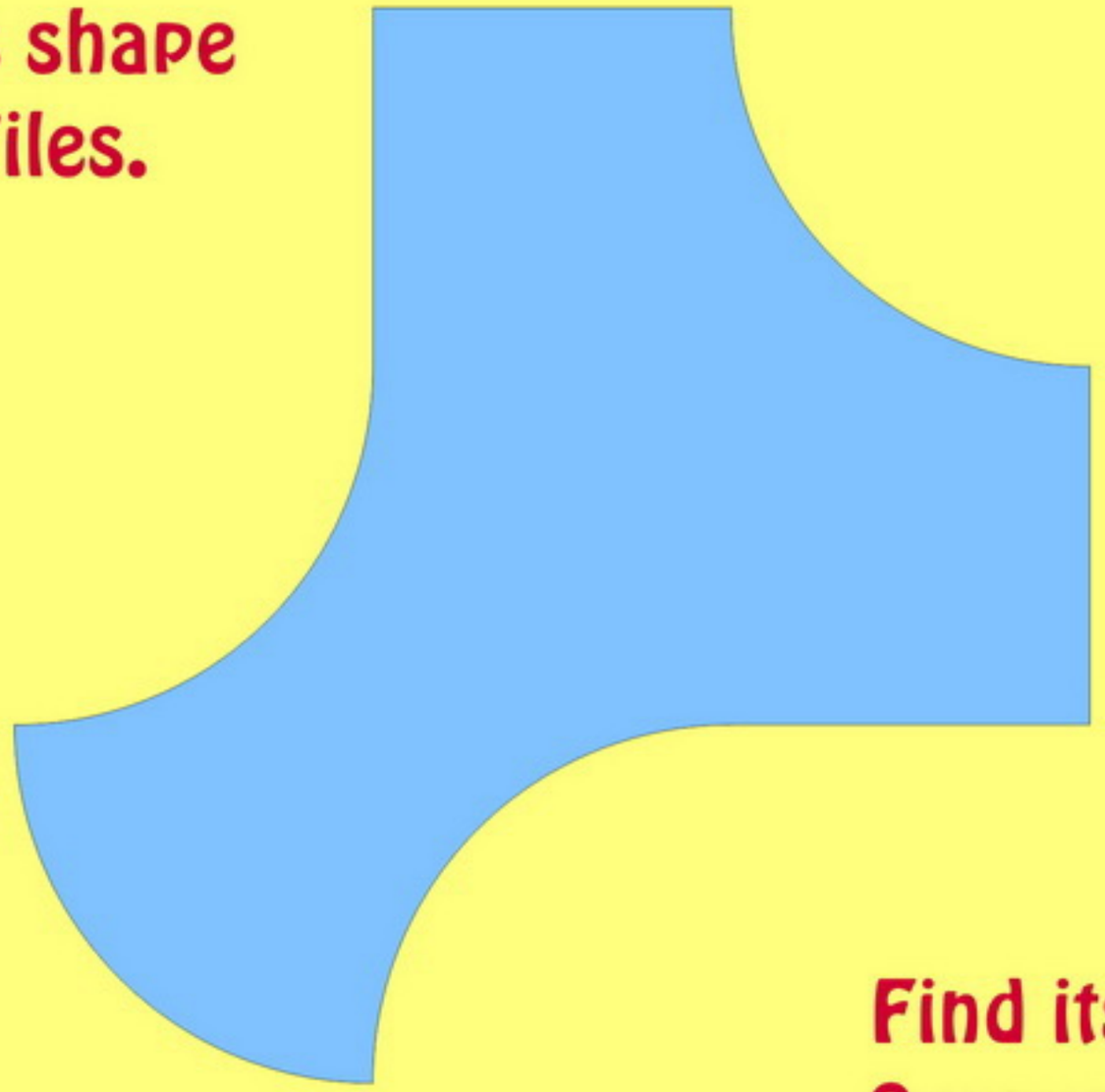
TWO WAYS



Is there a third way?

TWO WAYS

Make this shape
with TakTiles.



Find its area in
2 ways. Record.

TAKTILE TEASER

The eight TakTiles will fit inside your frame. How?

Calculate the total area of the TakTiles in 2 ways.

MORE?

MORE?

Go to the Investigation Guide