

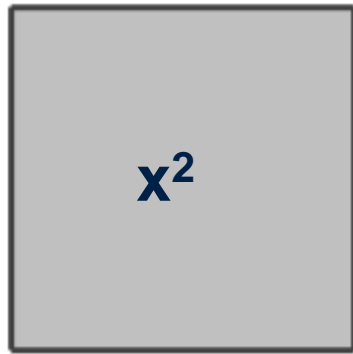


**Advanced Mathematics  
Support Programme®**

# Working with quadratics

# Areas

What is the area of each of the basic shapes?

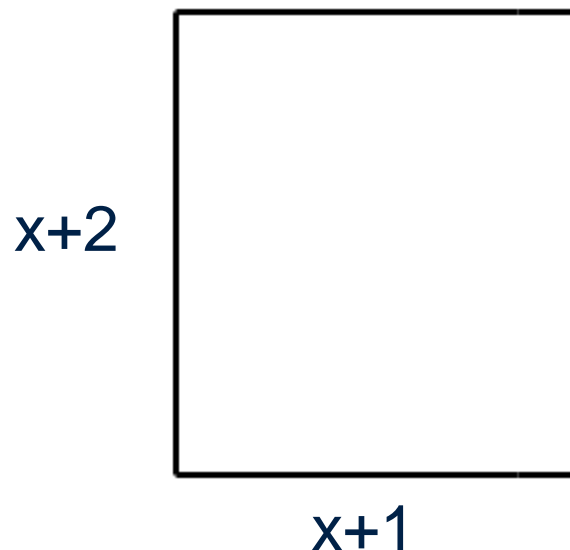

 $x^2$ 
 $x$ 
 $x$ 

 $x$ 
 $x$ 
 $1$ 

 $1$ 
 $1$

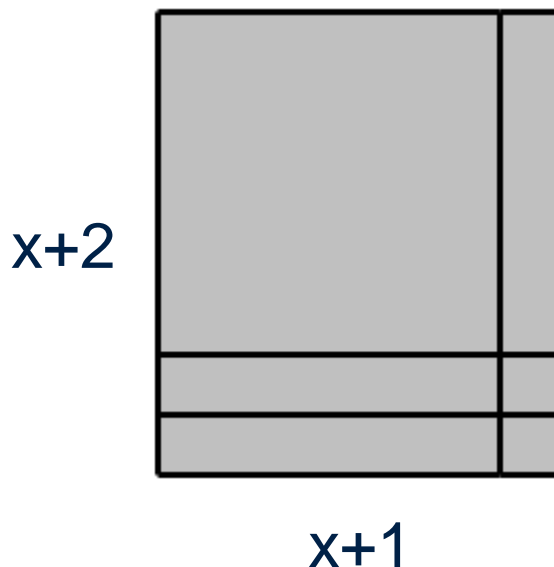
# Filling a rectangle

How could you fill the rectangle below using the shapes you have?



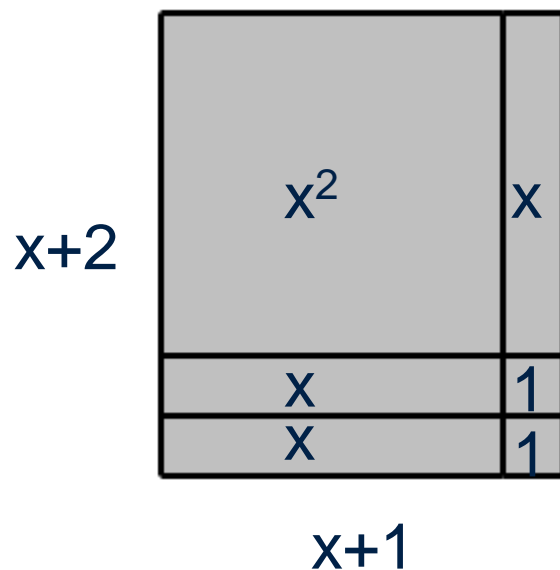
# Filling a rectangle

It should look something like this. If yours looks different, have you used the same pieces?



# Filling a rectangle

So what is the total area?



$$\text{Area} = x^2 + x + x + x + 1 + 1$$

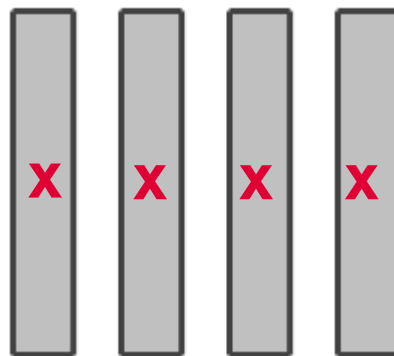
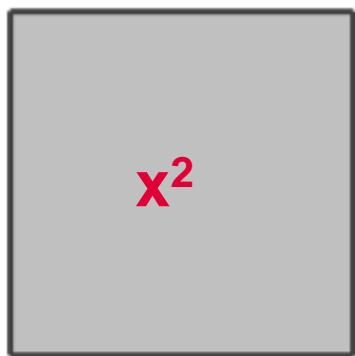
$$\text{Area} = x^2 + 3x + 2$$

$$(x+1)(x+2) = x^2 + 3x + 2$$

# Making rectangles

Rectangles can be made using the shapes.

Start with one  $x$  squared, four  $x$  by 1 rectangles and three single squares.

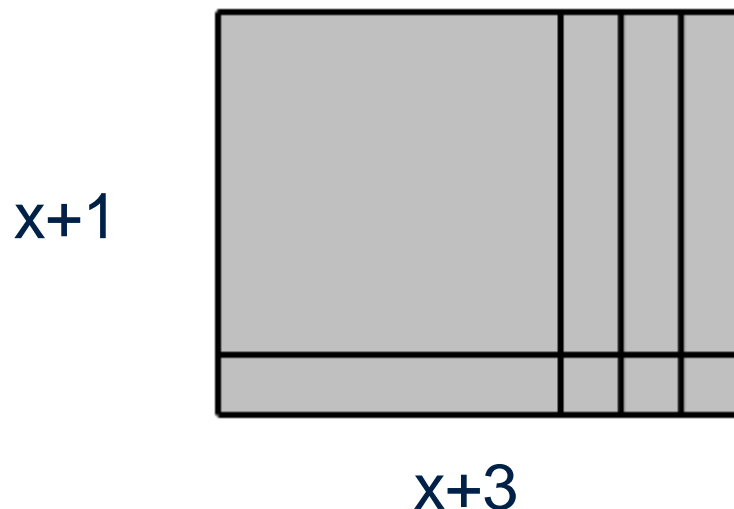


What area do you have?

$$\text{Area} = x^2 + 4x + 3$$

# Making rectangles

Make a rectangle using all the pieces – fitting them edge to edge.



What are the lengths of the sides of the rectangle (in terms of  $x$  and numbers)?

$$\text{So: } x^2 + 4x + 3 = (x+1)(x+3)$$



# Rectangles: questions

How could you represent  $(x+2)(x+3)$ ?

How could you represent  $(x+1)(x+4)$ ?

Sketch your rectangles to help you...

Can you make a rectangle for :  $x^2+7x+12$ ?

Can you make a different rectangle using the same pieces?

# Rectangles: Further questions

How could you represent  $(x+2)(x-1)$ ?

How could you represent  $(x-2)(x-1)$ ?

Can you make a rectangle for :  $(x+1)(x-1)$ ?

# About the AMSP

- A government-funded initiative, managed by MEI, providing national support for teachers and students in all state-funded schools and colleges in England.
- It aims to increase participation in AS/A level Mathematics and Further Mathematics, and Core Maths, and improve the teaching of these qualifications.
- Additional support is given to those in priority areas to boost social mobility so that, whatever their gender, background or location, students can choose their best maths pathway post-16, and have access to high quality maths teaching.

# Contact the AMSP



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