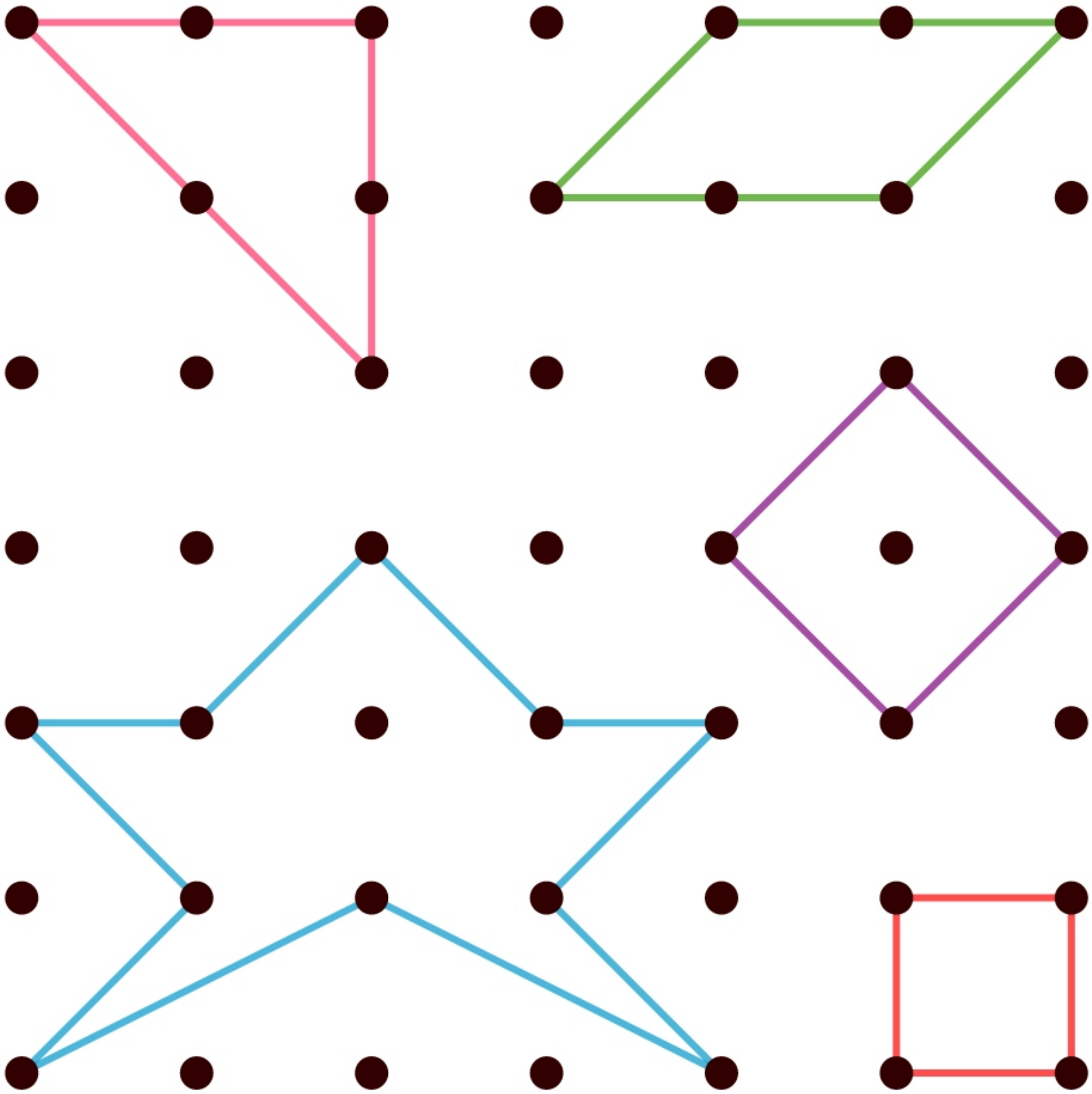
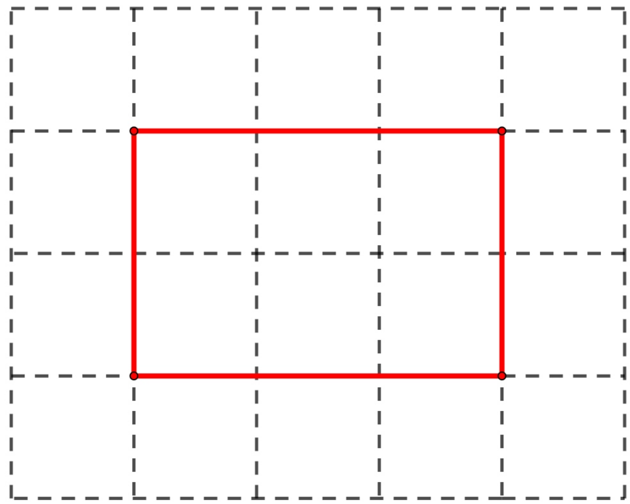


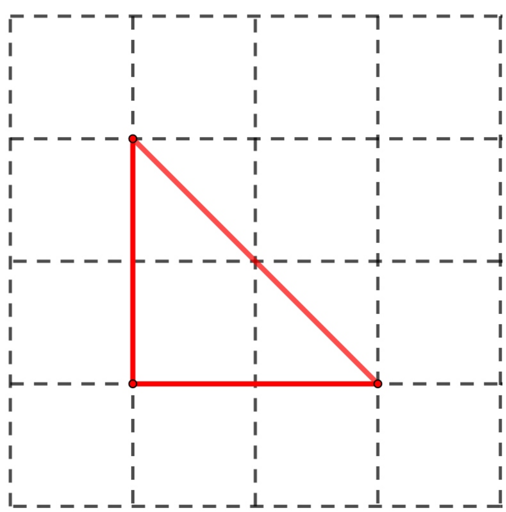
Geoboards & Pick’s Theorem

Can you calculate the area of this rectangle by counting the squares, or otherwise?

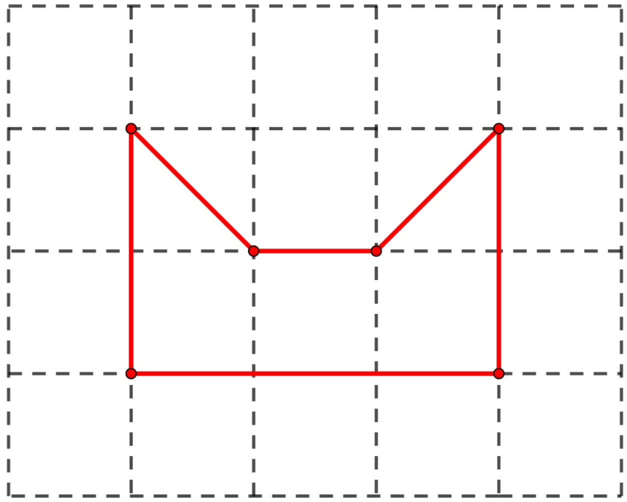


Area $=$ $\boxed{}$ square units

What about this triangle?



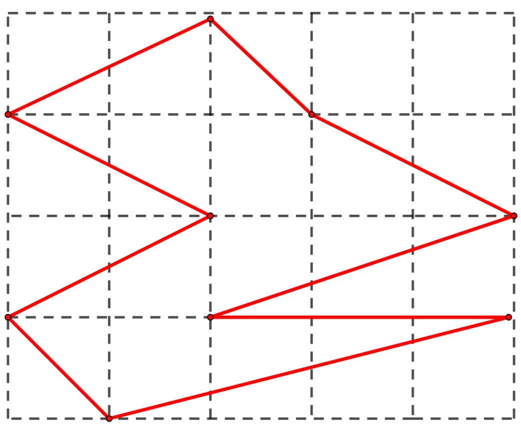
Area $=$ $\boxed{}$ square units



Area $=$ $\boxed{}$ square units

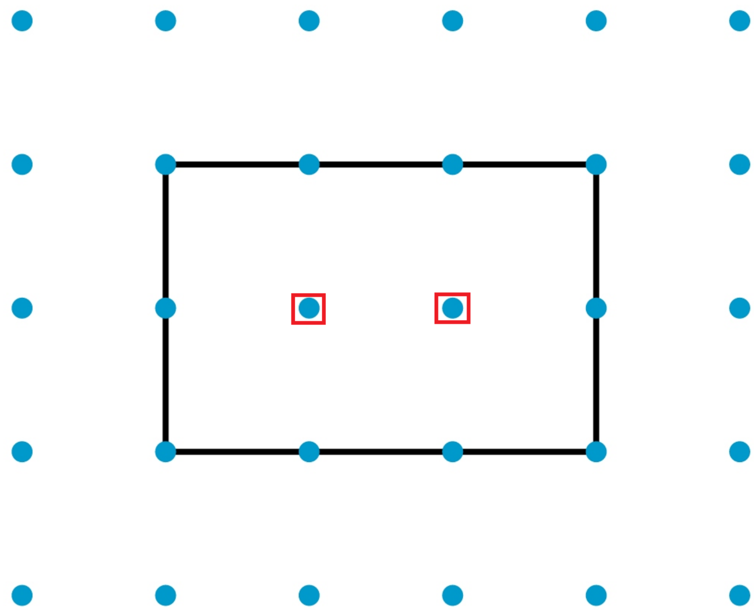
• • • • •

But it's much harder to find the area of unusual shapes, like this one:

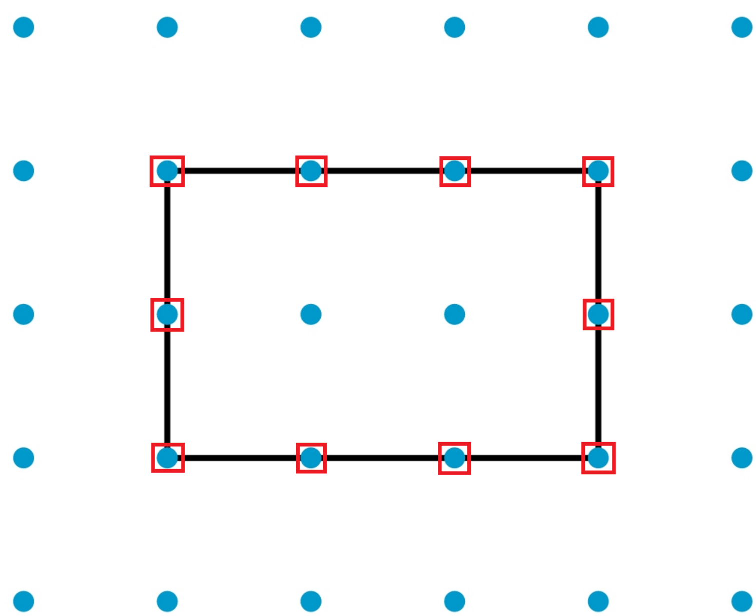


I wonder if there is an easier way to find the area of more complex shapes?

When you make a shape on a geoboard, the points inside the shape are called **interior points**.



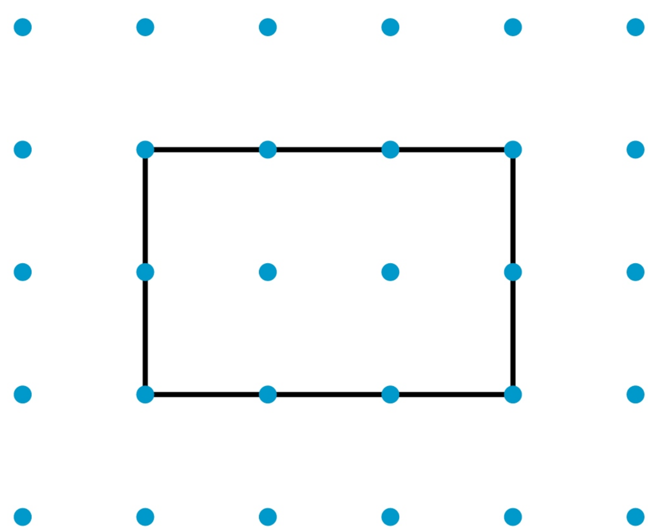
The points that the lines pass through are called **boundary points**.



A mathematician called Georg Alexander Pick discovered something special about shapes on geoboards...

$\mathbf{A}$	$=$	$\frac{\mathbf{B}}{\mathbf{2}}$	$+$	$\mathbf{I}$	$-$ $\mathbf{1}$
Area		half the number of boundary points		the number of interior points	

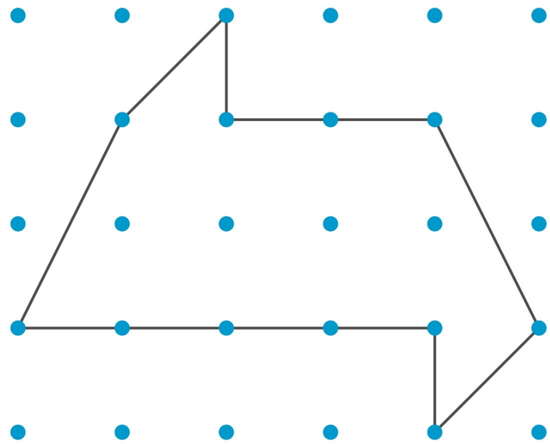
Let's try a shape together:



$\mathbf{B} = \square$ $\quad$ $\mathbf{I} = \square$

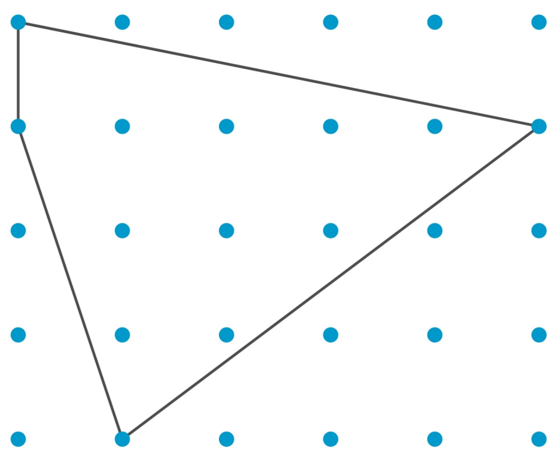
$\frac{\mathbf{B}}{\mathbf{2}}$		$\mathbf{I}$				**Area**	
$\square$	$+$	$\square$	$-$	1	$=$	$\square$	square units

Now try some yourself!



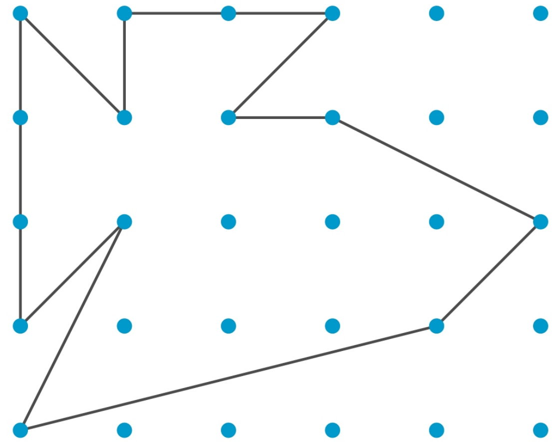
$\frac{\mathbf{B}}{\mathbf{2}}$ **I** **Area**

$\square + \square - 1 = \square$ square units



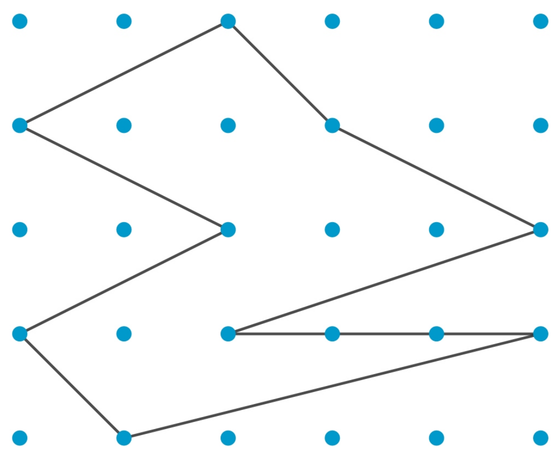
$\frac{\mathbf{B}}{\mathbf{2}}$ **I** **Area**

$\square + \square - 1 = \square$ square units



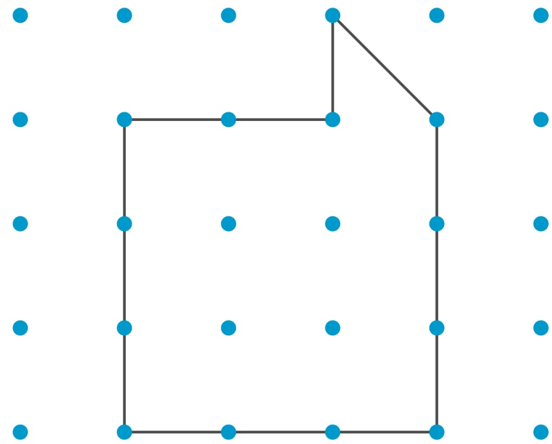
$\frac{\mathbf{B}}{\mathbf{2}}$ **I** **Area**

$\square + \square - 1 = \square$ square units



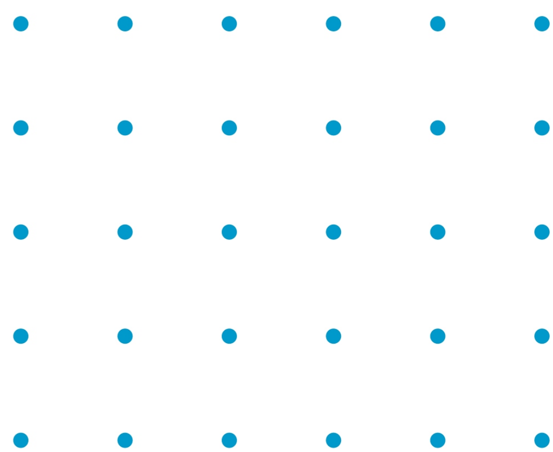
$\frac{\mathbf{B}}{\mathbf{2}}$ **I** **Area**

$\square + \square - 1 = \square$ square units



$\frac{\mathbf{B}}{\mathbf{2}}$		**I**			**Area**	
$\square$	+	$\square$	- 1	=	$\square$	square units

Now draw your own shape, and calculate the area!



$\frac{\mathbf{B}}{\mathbf{2}}$		**I**			**Area**	
$\square$	+	$\square$	- 1	=	$\square$	square units