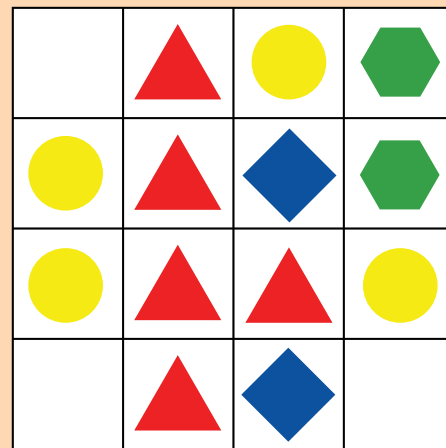
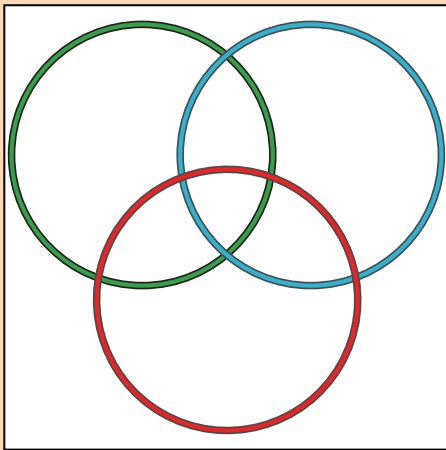


First Challenge Activities

Intriguing problems for pairs working together



1	2	3	4	1	2	3	4	5
5	6	7	8	6	7	8	9	10

a photocopiable resource from the
Association of Teachers of Mathematics

First Challenge Activities

First Challenge Activities were designed for Years 3 and 4 in particular to help children to work independently together in pairs. However the cards can be used by older groups.

The cards are intended to be used by pairs of learners working together to encourage mathematical discussion. All have some form of material or equipment that goes with them because this seems to foster thinking. It means that things can be done by learners without effecting the finished result, so things can be tried out in a non-threatening way, which might not be done if everything had to be written down.

First Challenge Activities can be copied onto thin card, or stuck onto card after copying. Covering or laminating will certainly extend their lives.

Numbered counters could be used instead of the small cards that are supplied with Cards 1, 4, 5, 6 and 8.

There are solutions given for all the activities, but these are not necessarily the only possible solutions.

Contents

Activities

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Jenny Murray has taught in Primary Schools and Teacher Education. Now she has retired she goes into schools to do interesting activities which involve learners in discussing maths together. *First Challenge Activities* are a result of this endeavour! Jenny is also an author for the NRICH web site.

First Challenge Activities ISBN - 978 1 898611 71 4

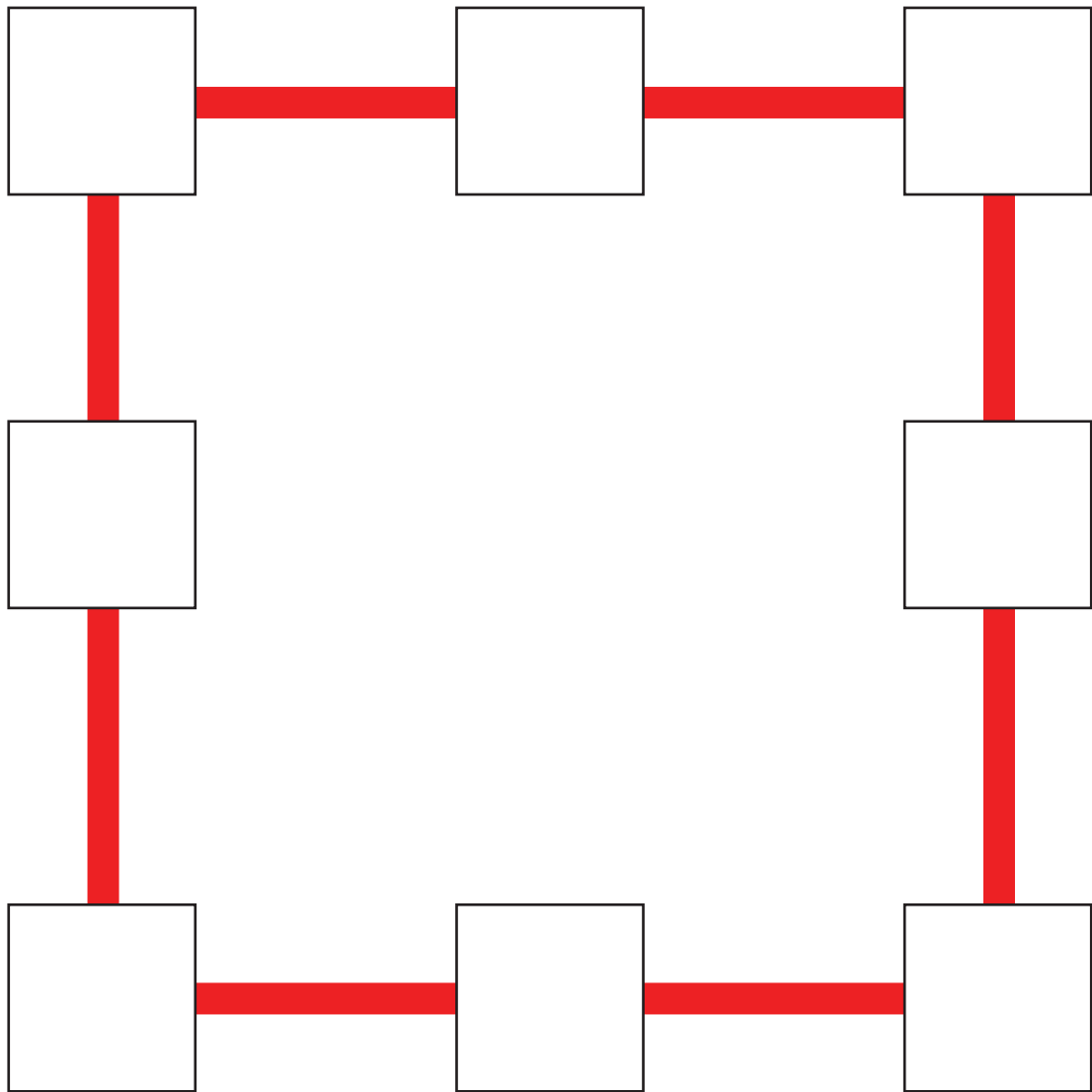
Published by the **Association of Teachers of Mathematics**

Unit 7, Prime Industrial Park, Shaftesbury Street Derby DE23 8YB

T - 01332 346599 F - 01332 204357 E - admin@atm.org.uk W - www.atm.org.uk

Numbers round a square

Put the small squares numbered 1 - 8 round the big square so that each side adds to 14.



What do the four corner numbers add to?

What do the other four numbers add to?

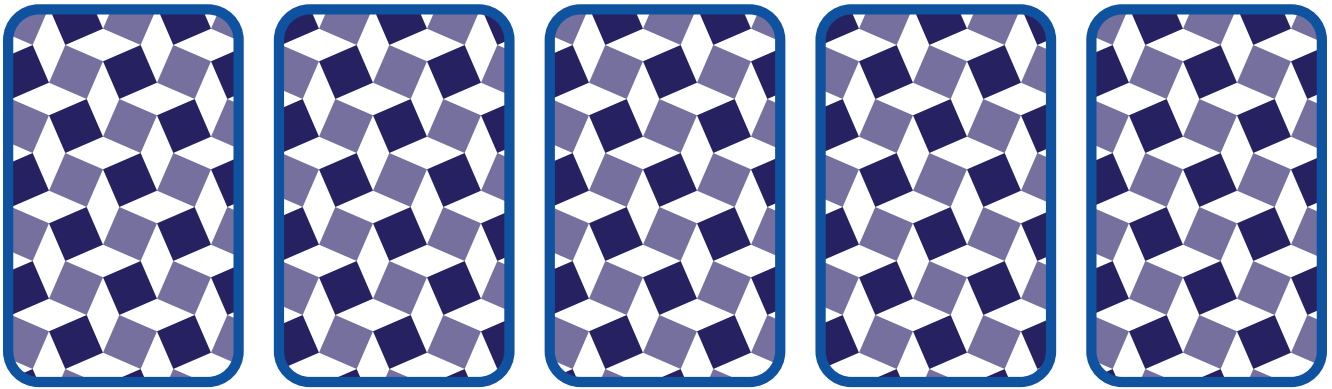
Can you make each of the sides add to other numbers?

What is the largest number you can make them add to?

Ben's cards

Ben has a set of ten cards numbered 0 - 9
with one digit on each card.

Ben lays five of the cards out face downwards
and hides the other five.



The numbers on the first and second cards add to 15,

The numbers on the second and third cards add to 12,

The numbers on the third and fourth cards add to 14,

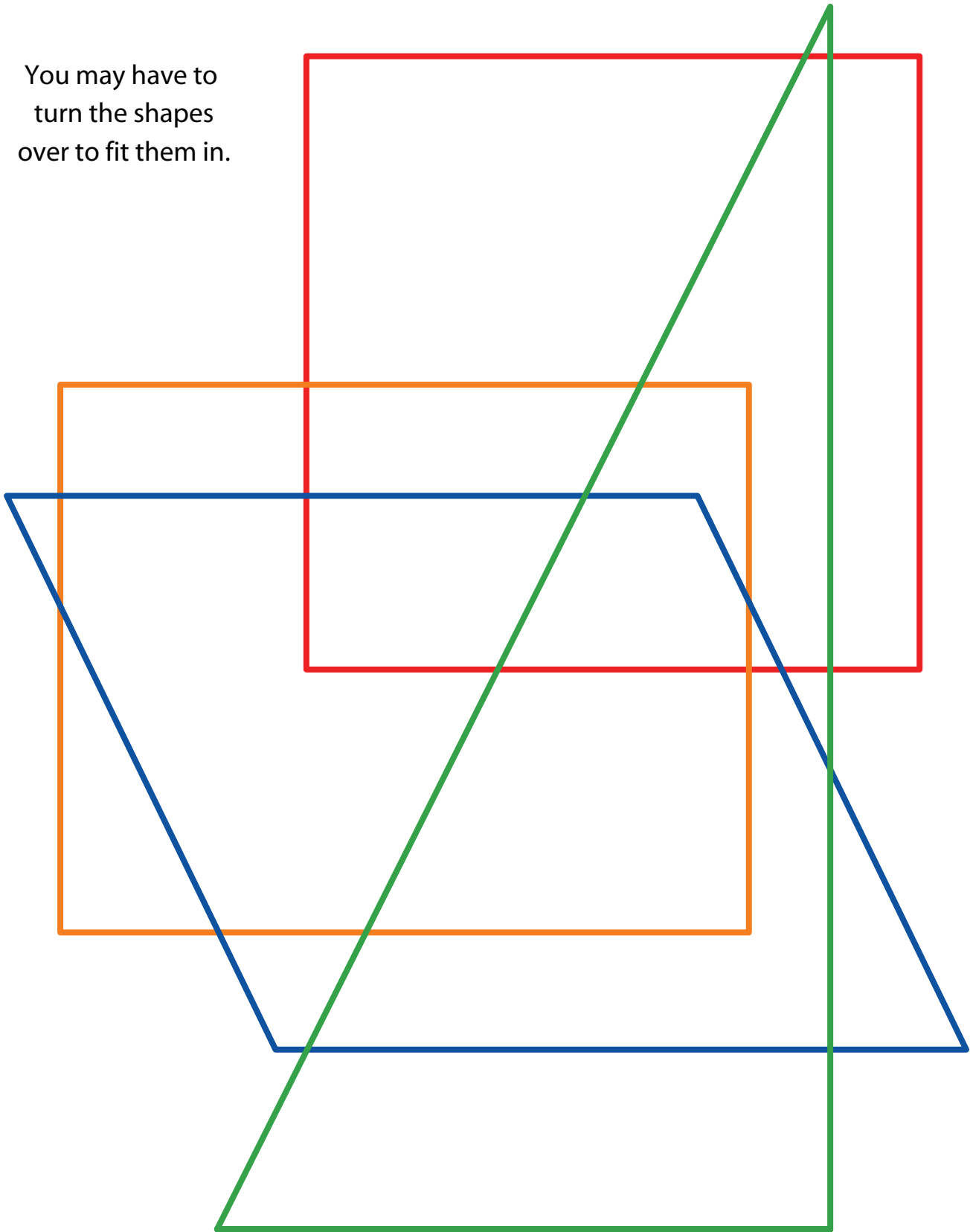
The numbers on the fourth and fifth cards add to 13.

What are the numbers on Ben's cards?

Making shapes

Can you build the rectangle, the parallelogram, the triangle and the square below using the 5 shapes supplied?

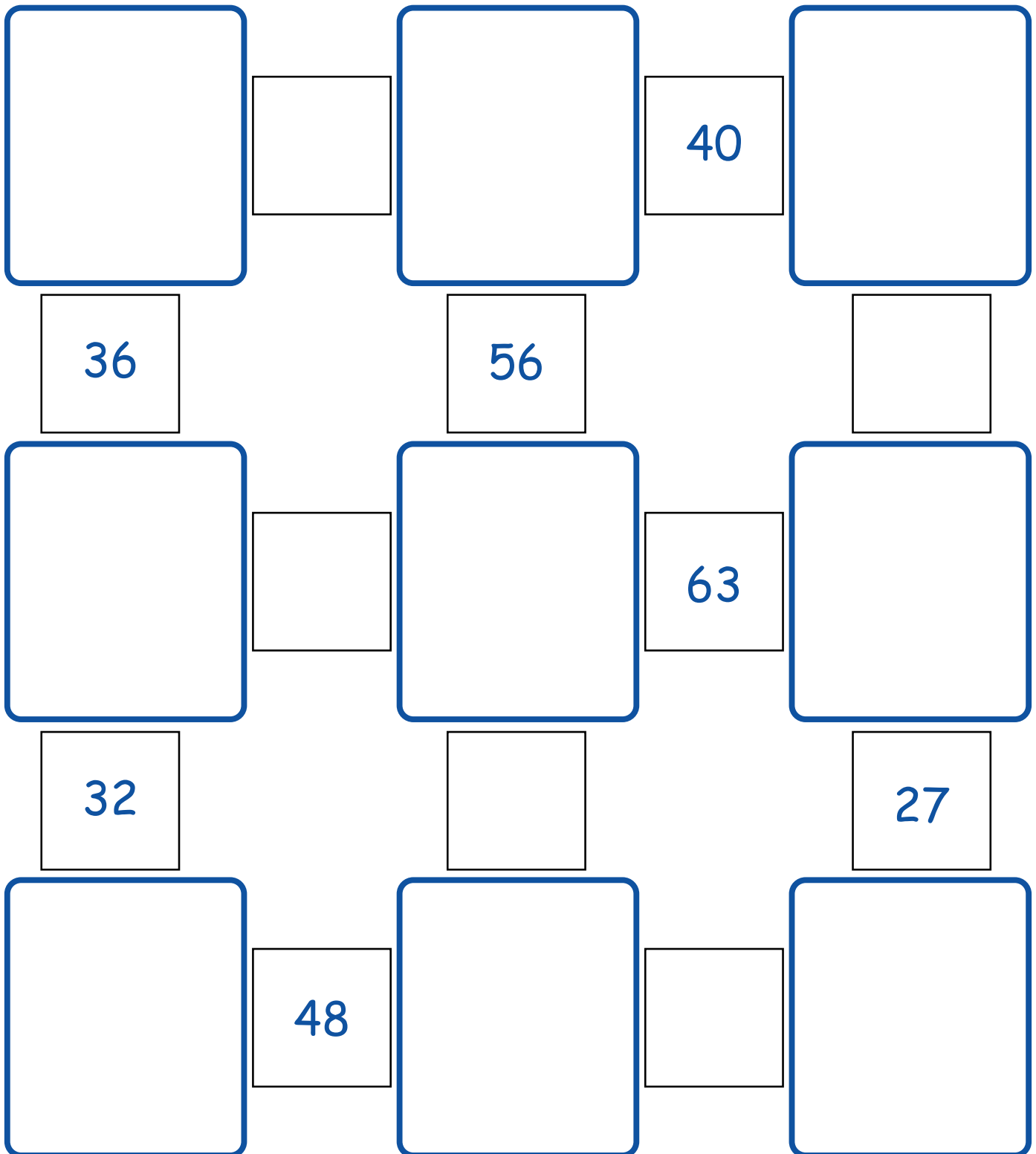
You may have to turn the shapes over to fit them in.



How well do you know your tables?

The numbers on the small squares are the product of the number cards on each side of them.

Can you fill in this whole square?



Three add to a hundred

Find two more numbers on the cards so that each row adds to 100.
You should be able to make all six lots of 100. Can you?

$$\boxed{28} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{64} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{57} + \boxed{} + \boxed{} = \boxed{100}$$

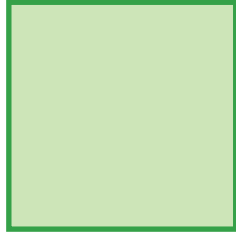
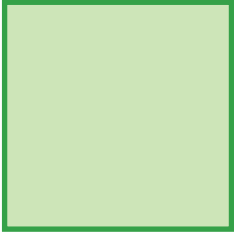
$$\boxed{21} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{7} + \boxed{} + \boxed{} = \boxed{100}$$

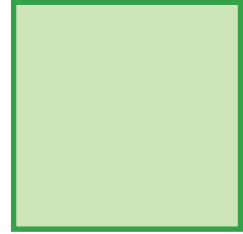
$$\boxed{9} + \boxed{} + \boxed{} = \boxed{100}$$

Eight pairs of numbers

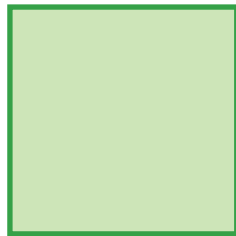
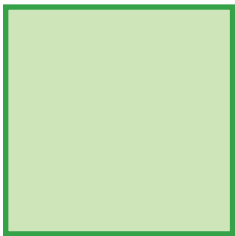
Use the numbered squares to make eight pairs of numbers that fit the clues.
There will be two squares over that you do not need.



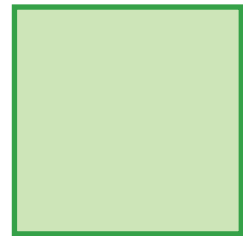
If you add them you get 15.
The difference between them is 3.



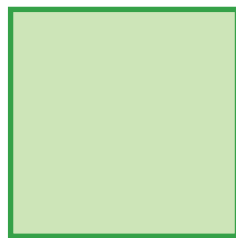
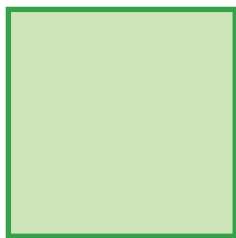
If you add them you get 12.
If you multiply them you get 35.



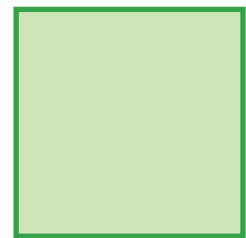
Half of one is equal to twice the other.
Their sum is 10.



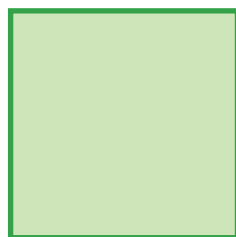
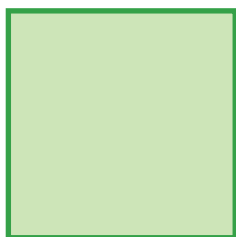
If you multiply them you get twice
what you get if you add them.
The difference between them is 3.



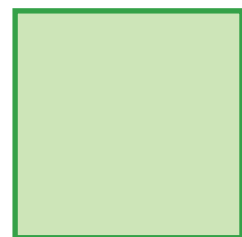
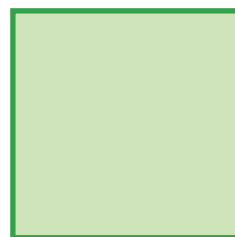
If you add them you get 5 less
than if you multiply them.
The difference between them is one.



If you multiply them you get 40.
If you add them you get 13.



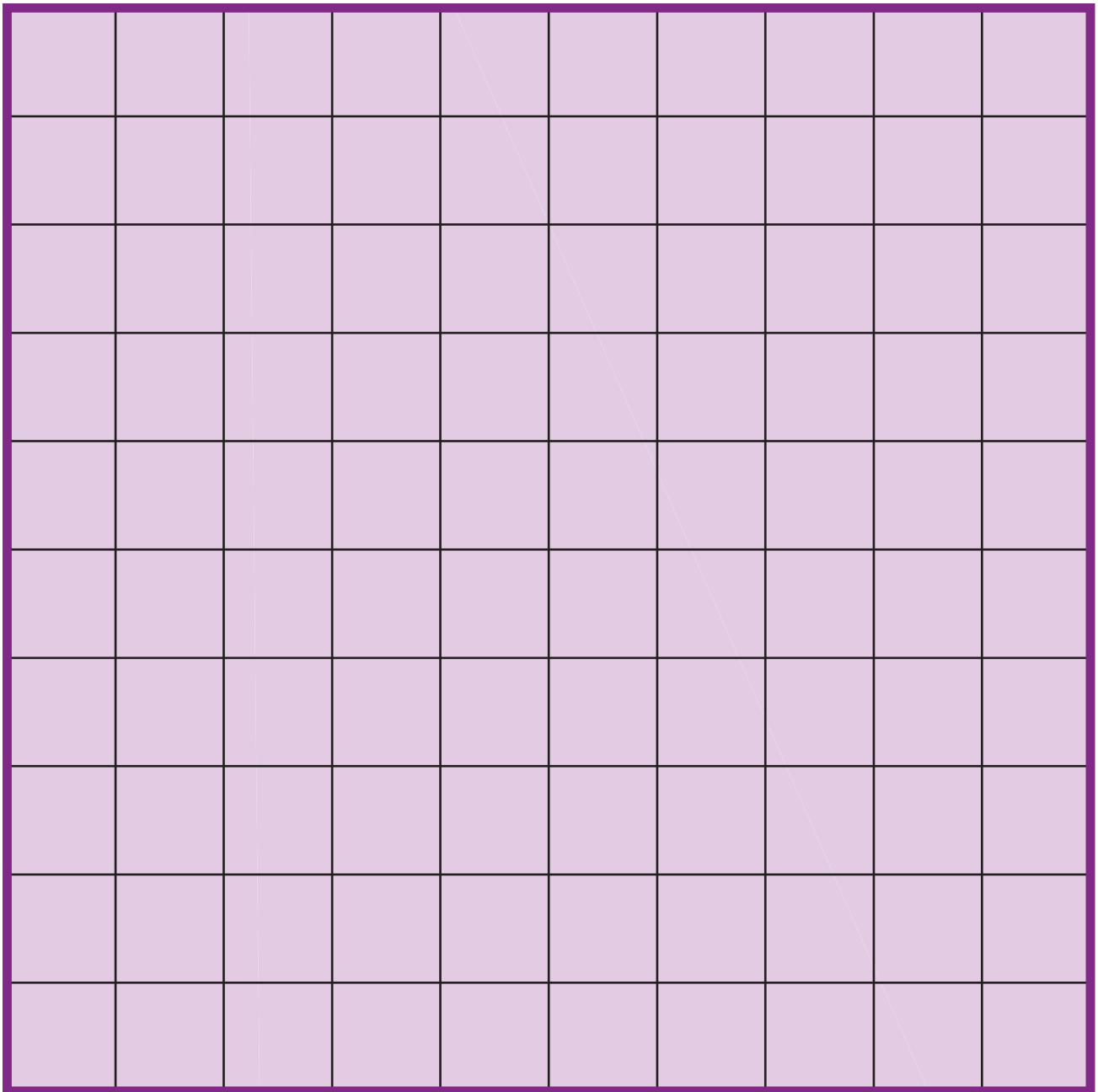
They add to 6.
One number is double the other number.



If you add them you get 16.
The difference between them is 2.

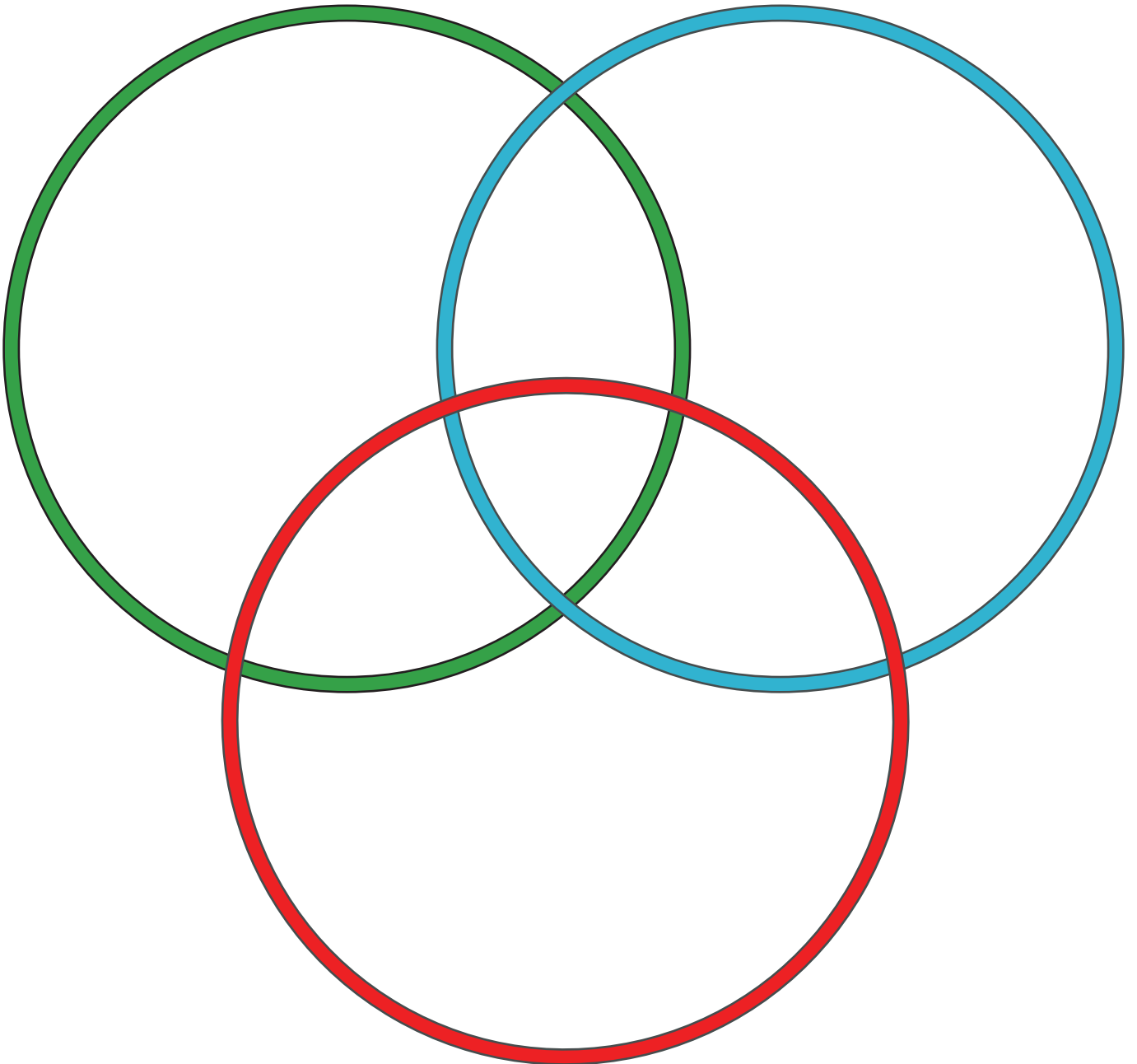
Hundred square puzzle

Can you build up this hundred square from the pieces supplied?



Numbers in circles

Put the squares numbered 1 - 10 in the circles
so that the numbers in each circle add to 27.

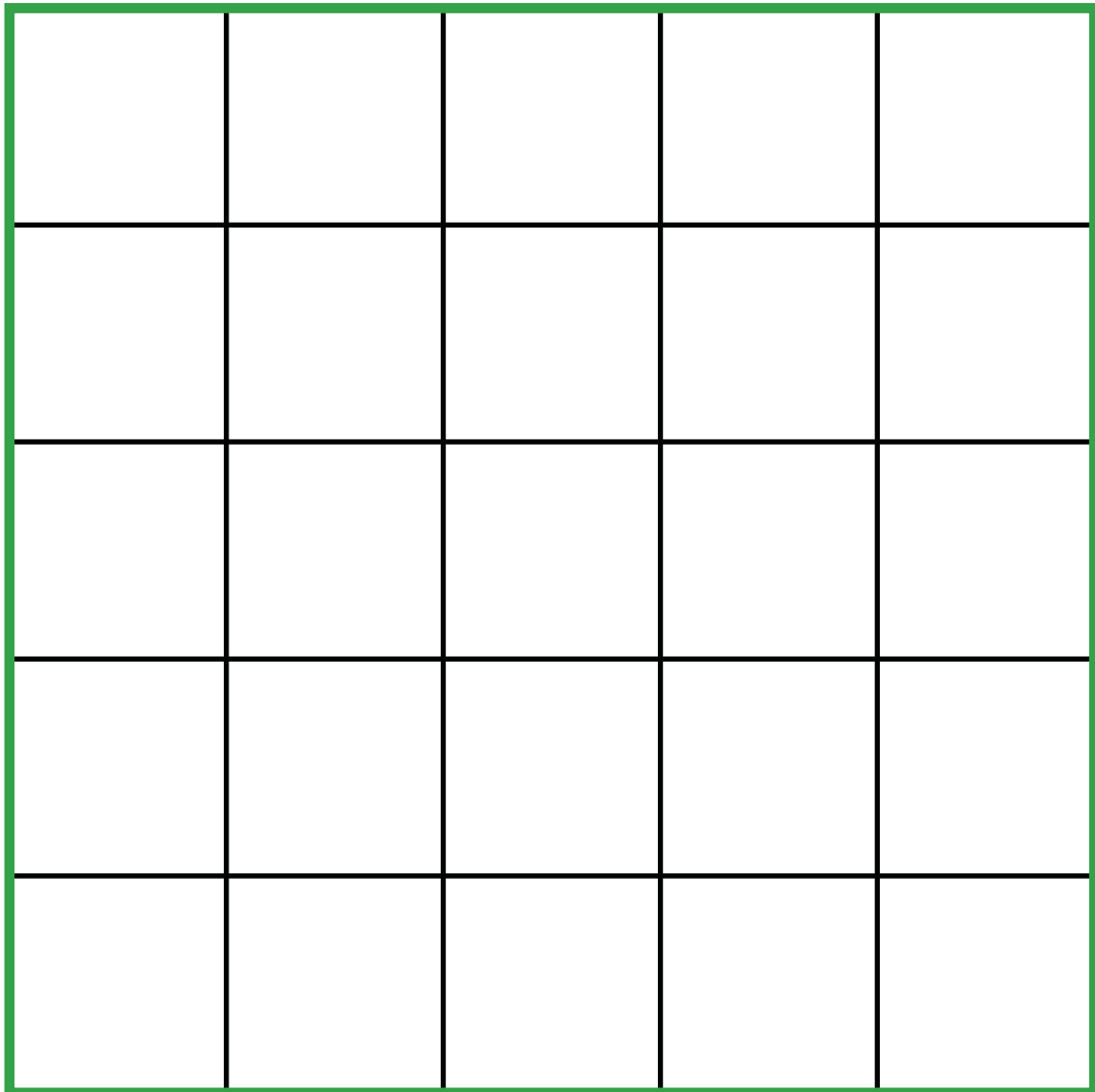


If there must be at least one number in each region
and you must use all the counters -

1. What is the smallest number you can make in each circle?
2. What is the largest number you can make in each circle?

Tile the square

Can you use the 25 shape tiles to cover the square below so that no column, no row and no diagonal line have the same shape in them?

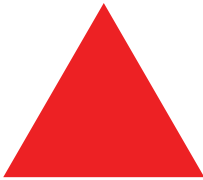
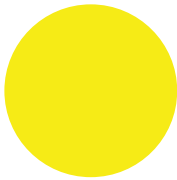
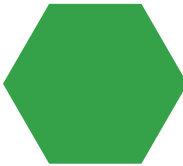
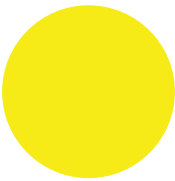

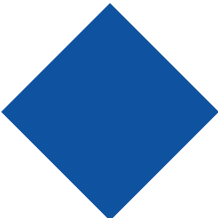

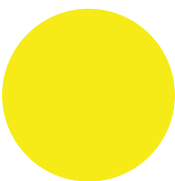


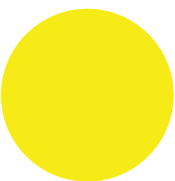

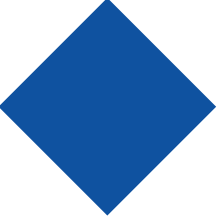


Shapes in a grid

The shapes stand for four numbers

You are given the totals of each row and column
in the rectangular boxes.

Can you place the shapes you need to make the required totals?
(There will be one shape left over.)

				10
				10
				10
				12
10	12	13	7	

Numbers round a square

Cut into 9 separate cards

1	2	3	4
5	6	7	8

Ben's cards

Cut into 10 separate cards

0	1	2	3	4
5	6	7	8	9

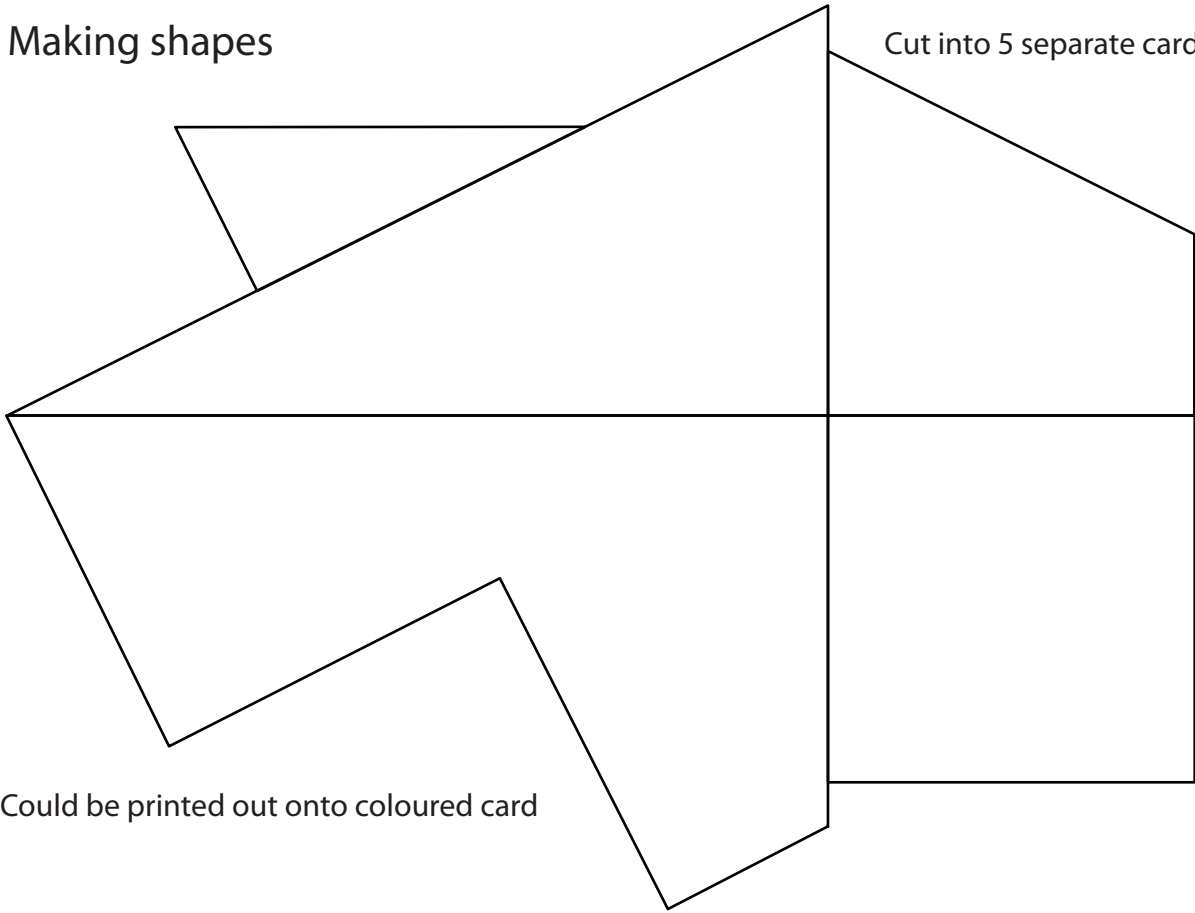
Numbers in circles

Cut into 10 separate cards

1	2	3	4	5
6	7	8	9	10

Making shapes

Cut into 5 separate cards



Could be printed out onto coloured card

How well do you know your tables?

Cut into 9 large and 5 small cards

5	8	9
4	7	9
3	6	8

18	28	42	45	72
----	----	----	----	----

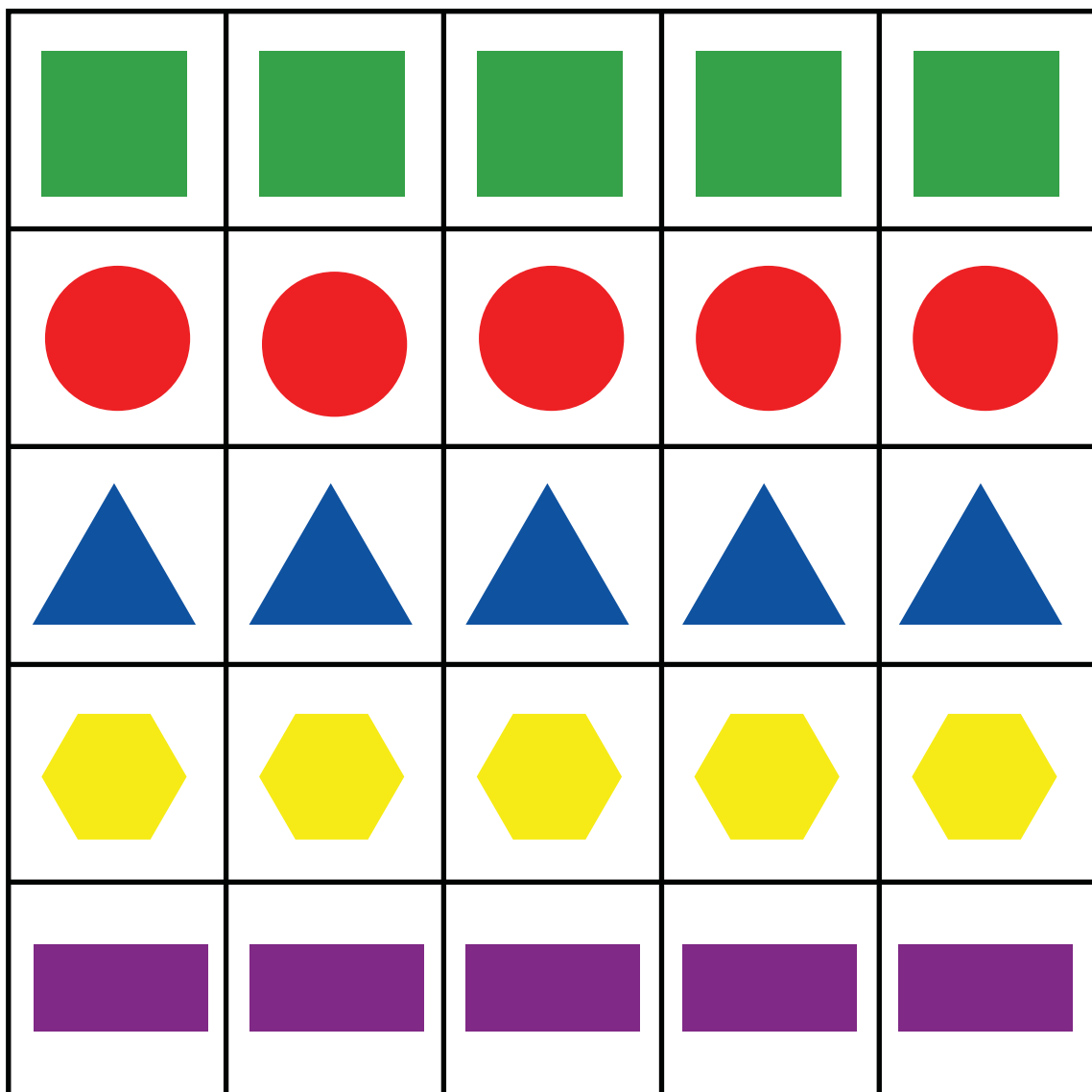
Eight pairs of numbers

Cut into 16 separate cards

1	2	2	3	3	4
4	5	5	6	6	7
7	8	8	9	9	10

Tile the square

Cut into 25 separate cards



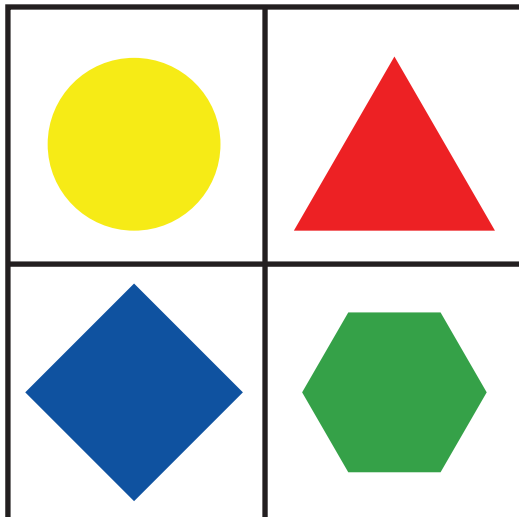
Hundred square puzzle

Cut into 13 pieces down dashed lines

51				85	87		82	
		63	94				91	
71		73			47		2	
		10	54			11		13
				65	67		22	
78					76		31	
		90		5	7		42	
98					16		29	
58				25		27	38	40
	69		34		36		49	

Shapes in a grid

Cut into 4 separate cards



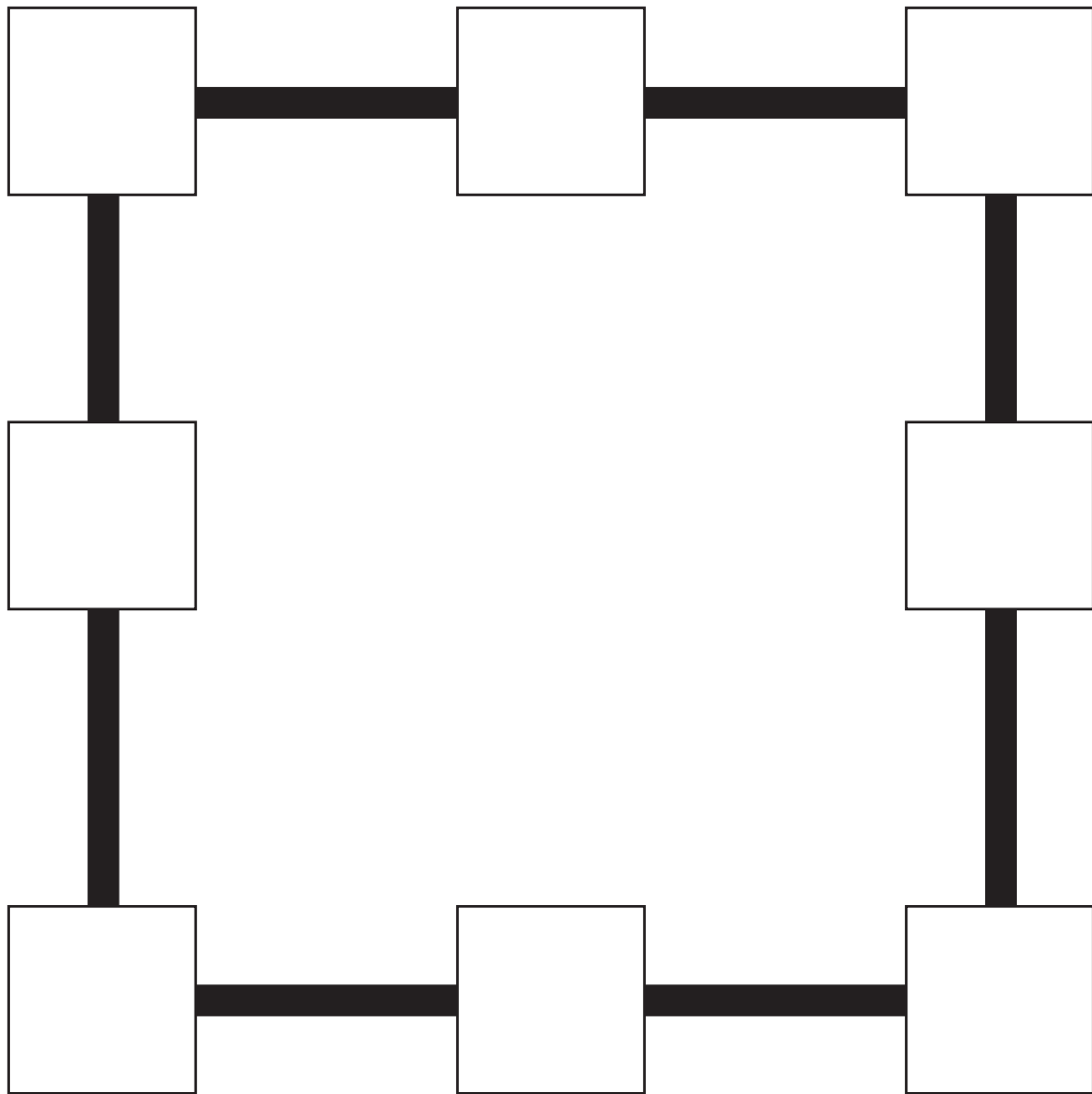
Three add to a hundred

Cut into 12 separate cards

10	20	42	86
6	16	30	83
5	14	29	73

Numbers round a square

Put the small squares numbered 1 - 8 round the big square so that each side adds to 14.



What do the four corner numbers add to?

What do the other four numbers add to?

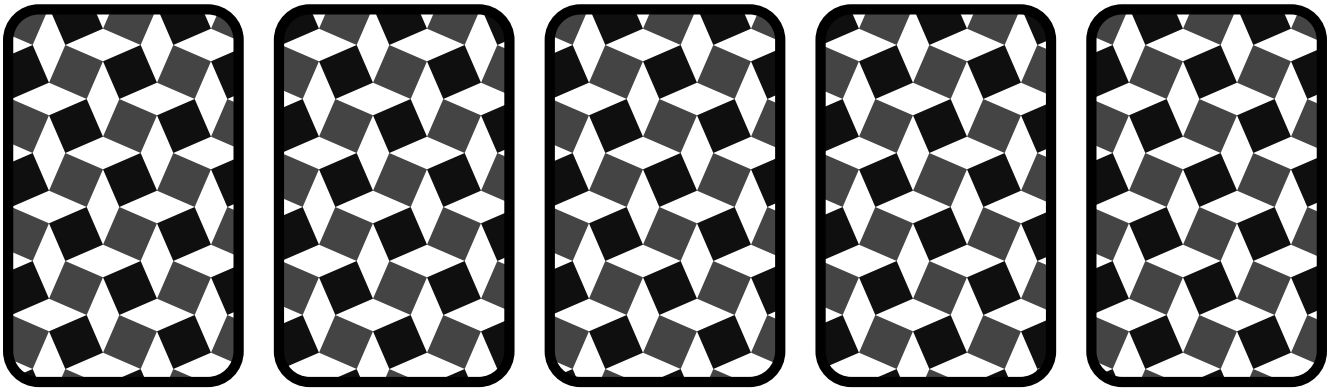
Can you make each of the sides add to other numbers?

What is the largest number you can make them add to?

Ben's cards

Ben has a set of ten cards numbered 0 - 9
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Ben lays five of the cards out face downwards
and hides the other five.



The numbers on the first and second cards add to 15,

The numbers on the second and third cards add to 12,

The numbers on the third and fourth cards add to 14,

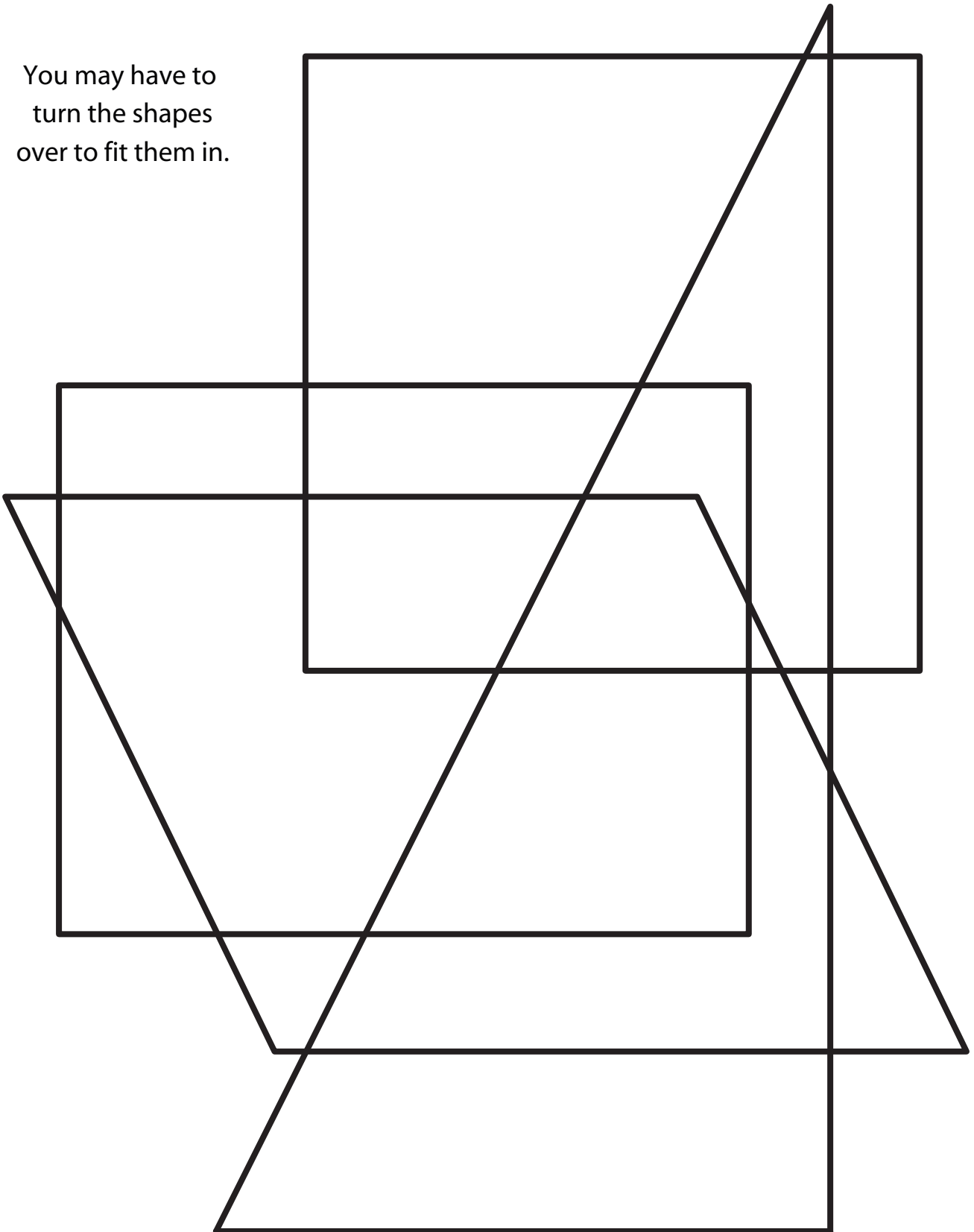
The numbers on the fourth and fifth cards add to 13.

What are the numbers on Ben's cards?

Making shapes

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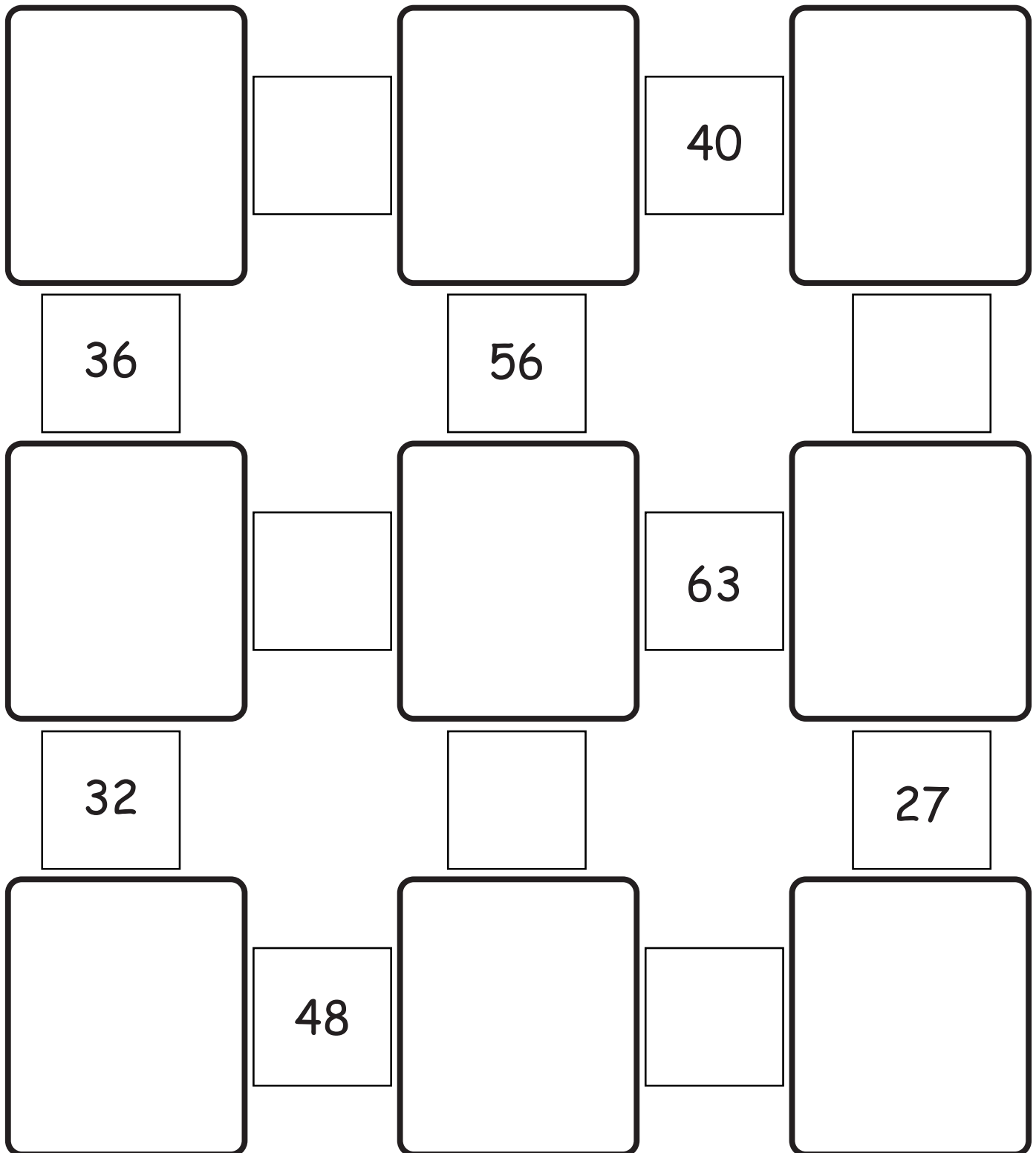
You may have to turn the shapes over to fit them in.



How well do you know your tables?

The numbers on the small squares are the product of the number cards on each side of them.

Can you fill in this whole square?



Three add to a hundred

Find two more numbers on the cards so that each row adds to 100.
You should be able to make all six lots of 100. Can you?

$$\boxed{28} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{64} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{57} + \boxed{} + \boxed{} = \boxed{100}$$

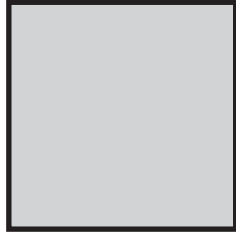
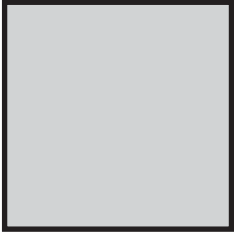
$$\boxed{21} + \boxed{} + \boxed{} = \boxed{100}$$

$$\boxed{7} + \boxed{} + \boxed{} = \boxed{100}$$

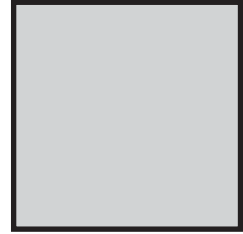
$$\boxed{9} + \boxed{} + \boxed{} = \boxed{100}$$

Eight pairs of numbers

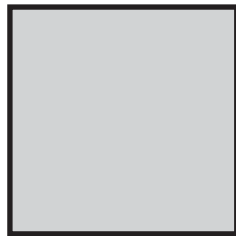
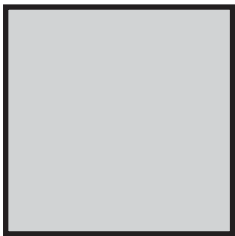
Use the numbered squares to make eight pairs of numbers that fit the clues.
There will be two squares over that you do not need.



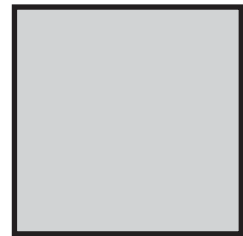
If you add them you get 15.
The difference between them is 3.



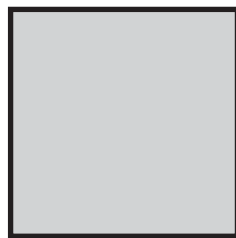
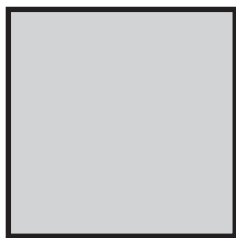
If you add them you get 12.
If you multiply them you get 35.



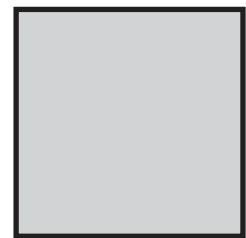
Half of one is equal to twice the other.
Their sum is 10.



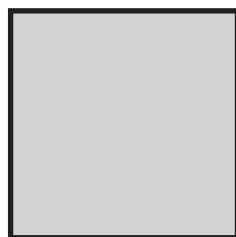
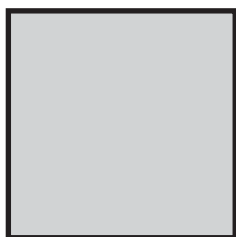
If you multiply them you get twice
what you get if you add them.
The difference between them is 3.



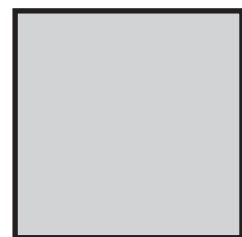
If you add them you get 5 less
than if you multiply them.
The difference between them is one.



If you multiply them you get 40.
If you add them you get 13.



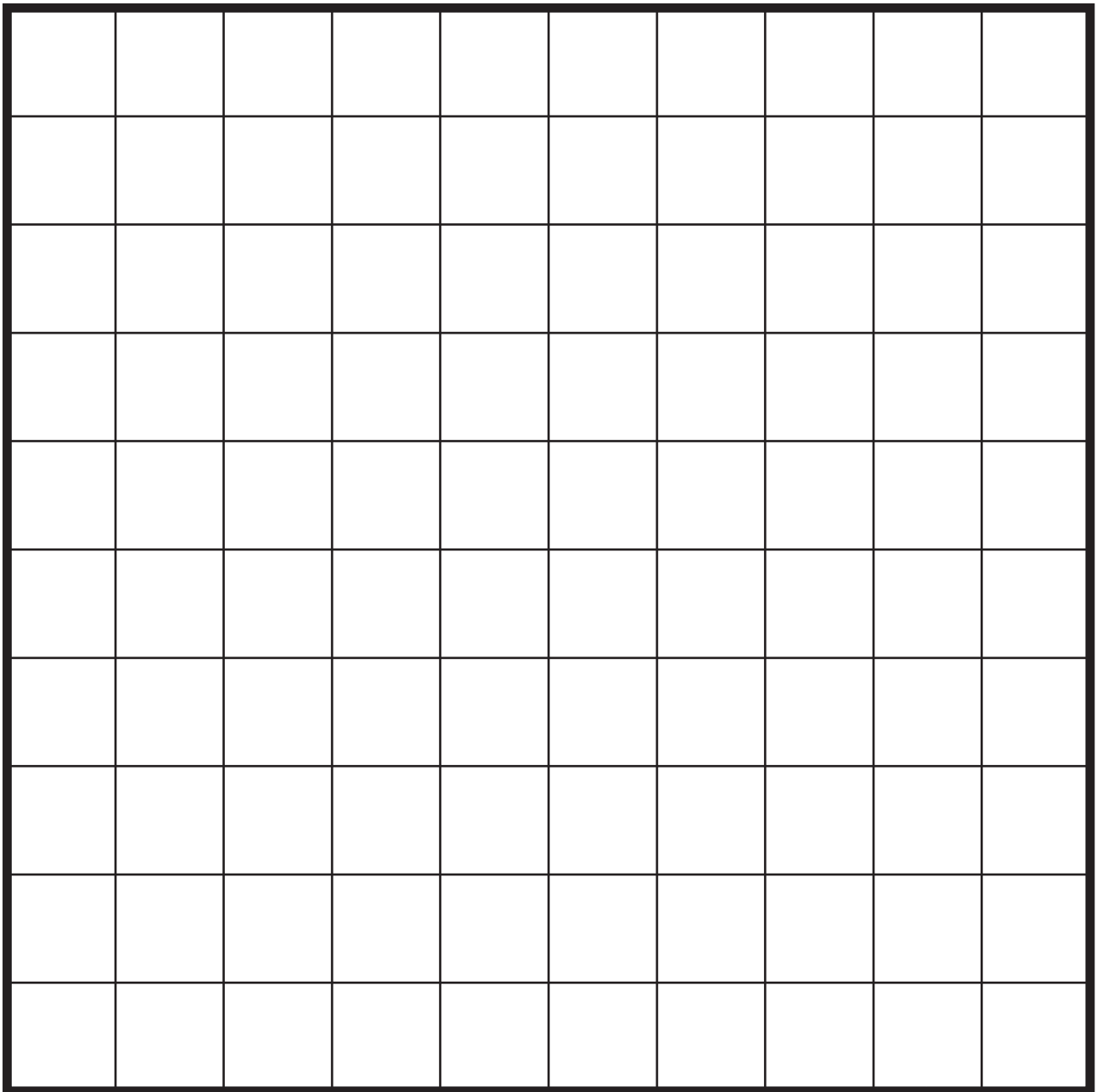
They add to 6.
One number is double the other number.



If you add them you get 16.
The difference between them is 2.

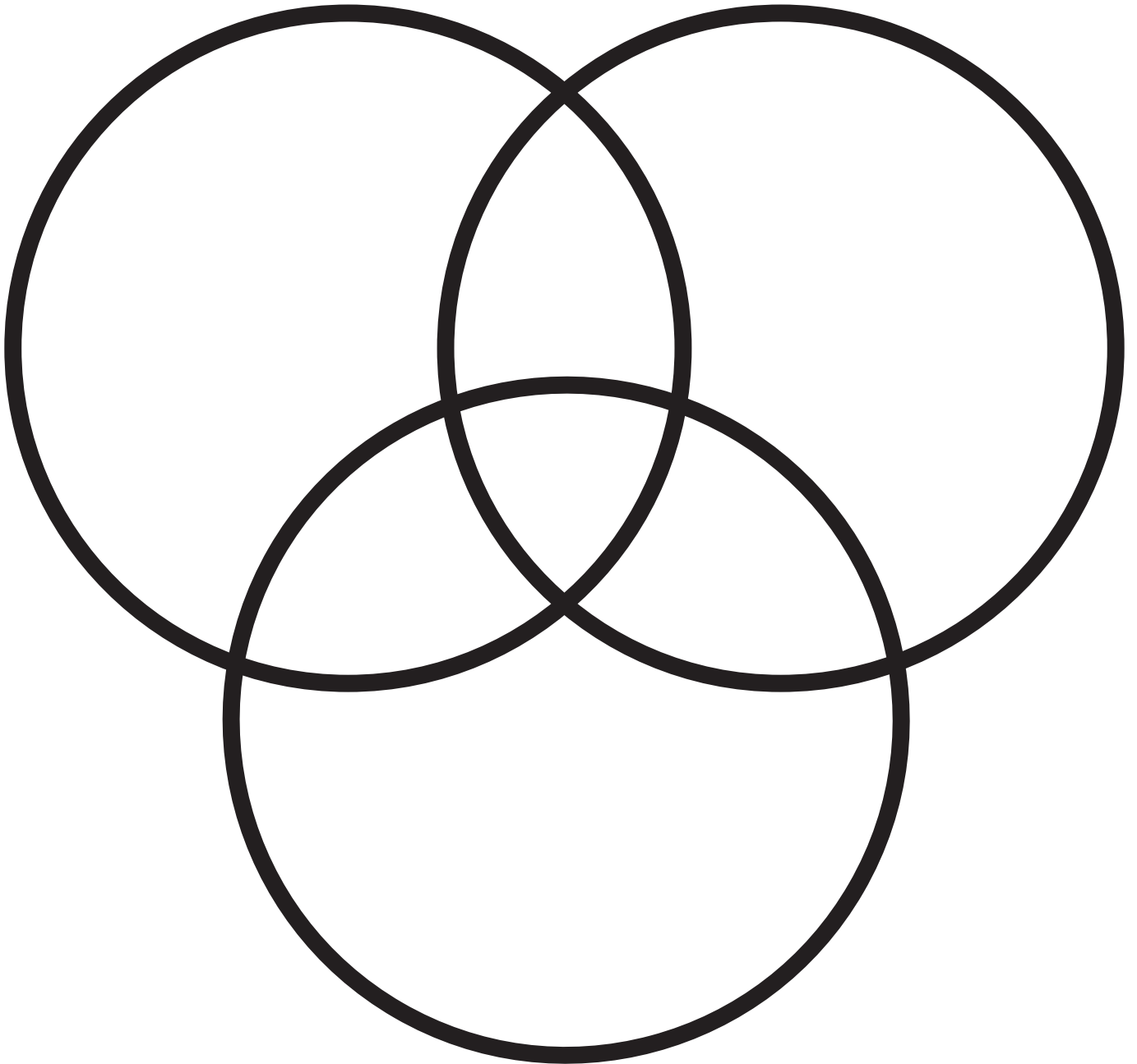
Hundred square puzzle

Can you build up this hundred square from the pieces supplied?



Numbers in circles

Put the squares numbered 1 - 10 in the circles
so that the numbers in each circle add to 27.

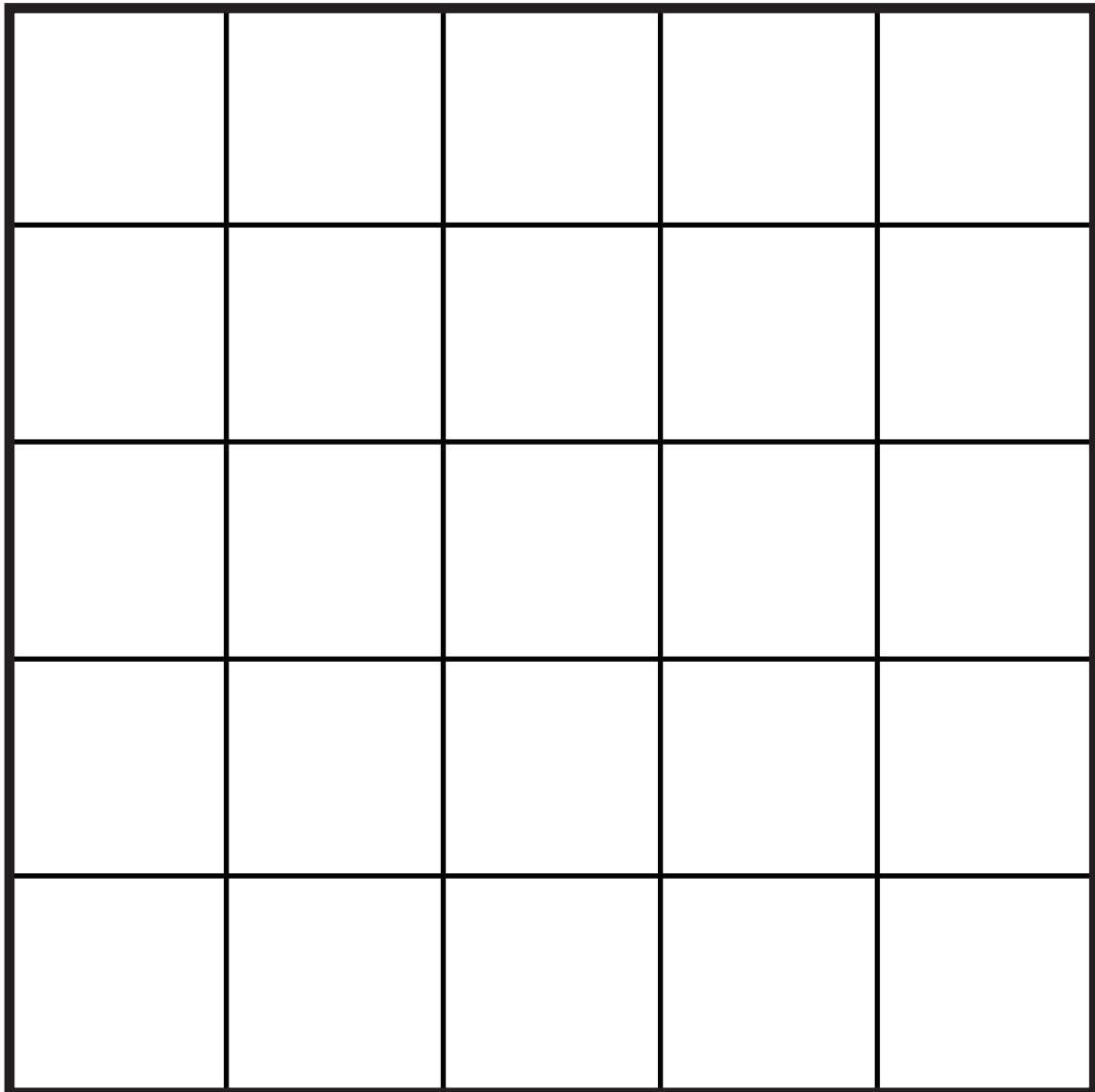


If there must be at least one number in each region
and you must use all the counters -

1. What is the smallest number you can make in each circle?
2. What is the largest number you can make in each circle?

Tile the square

Can you use the 25 shape tiles to cover the square below so that no column, no row and no diagonal line have the same shape in them?




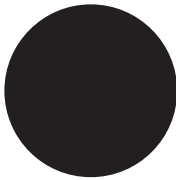

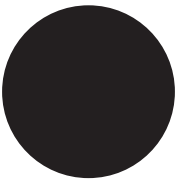

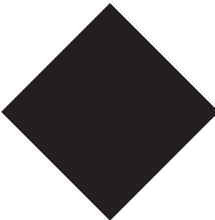

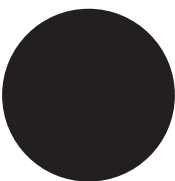


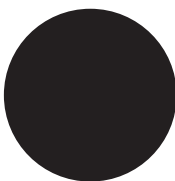

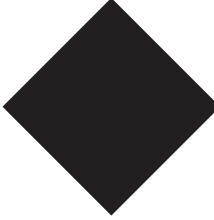
Shapes in a grid

The shapes stand for four numbers

You are given the totals of each row and column
in the rectangular boxes.

Can you place the shapes you need to make the required totals?

(There will be one shape left over.)

				10
				10
				10
				12
10	12	13	7	

Numbers round a square

Cut into 9 separate cards

1	2	3	4
5	6	7	8

Ben's cards

Cut into 10 separate cards

0	1	2	3	4
5	6	7	8	9

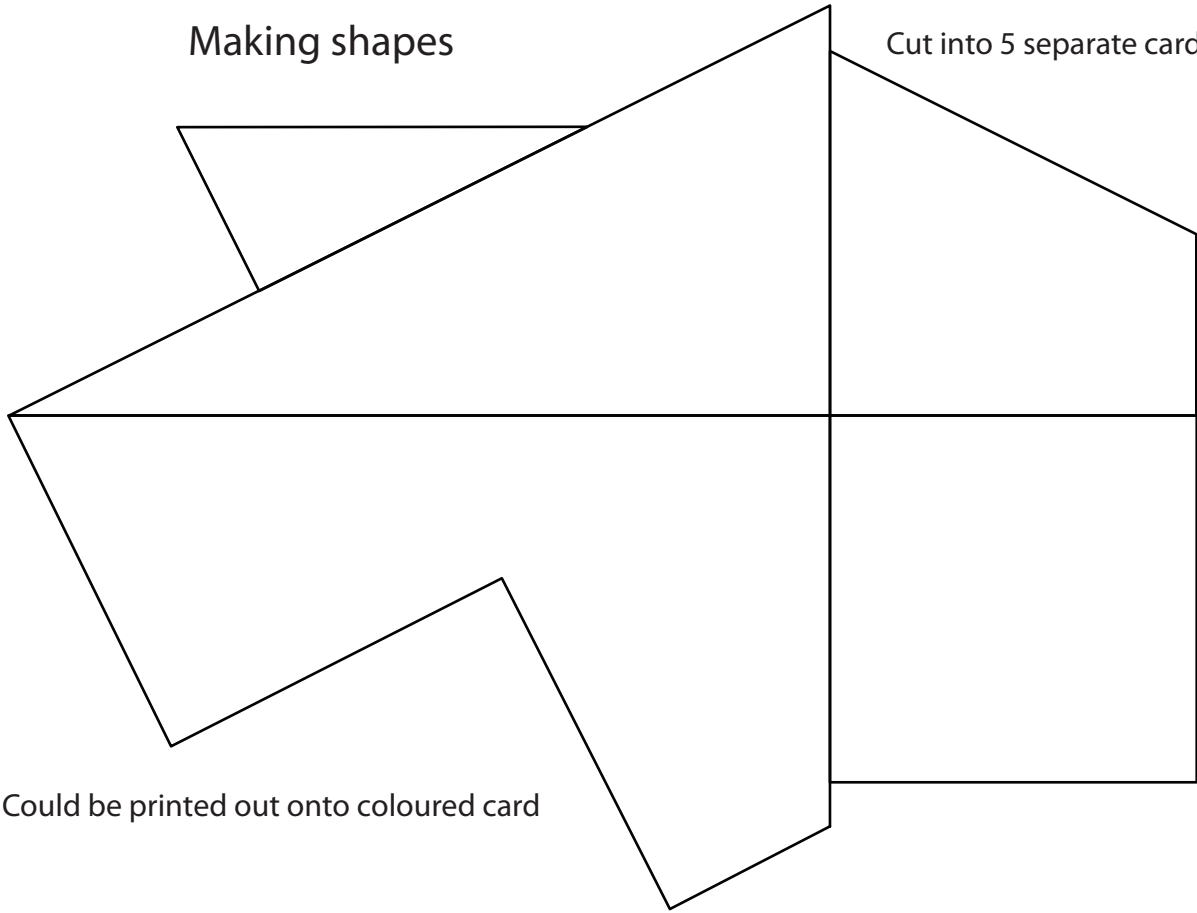
Numbers in circles

Cut into 10 separate cards

1	2	3	4	5
6	7	8	9	10

Making shapes

Cut into 5 separate cards



Could be printed out onto coloured card

How well do you know your tables?

Cut into 9 large and 5 small cards

5	8	9
4	7	9
3	6	8

18	28	42	45	72
----	----	----	----	----

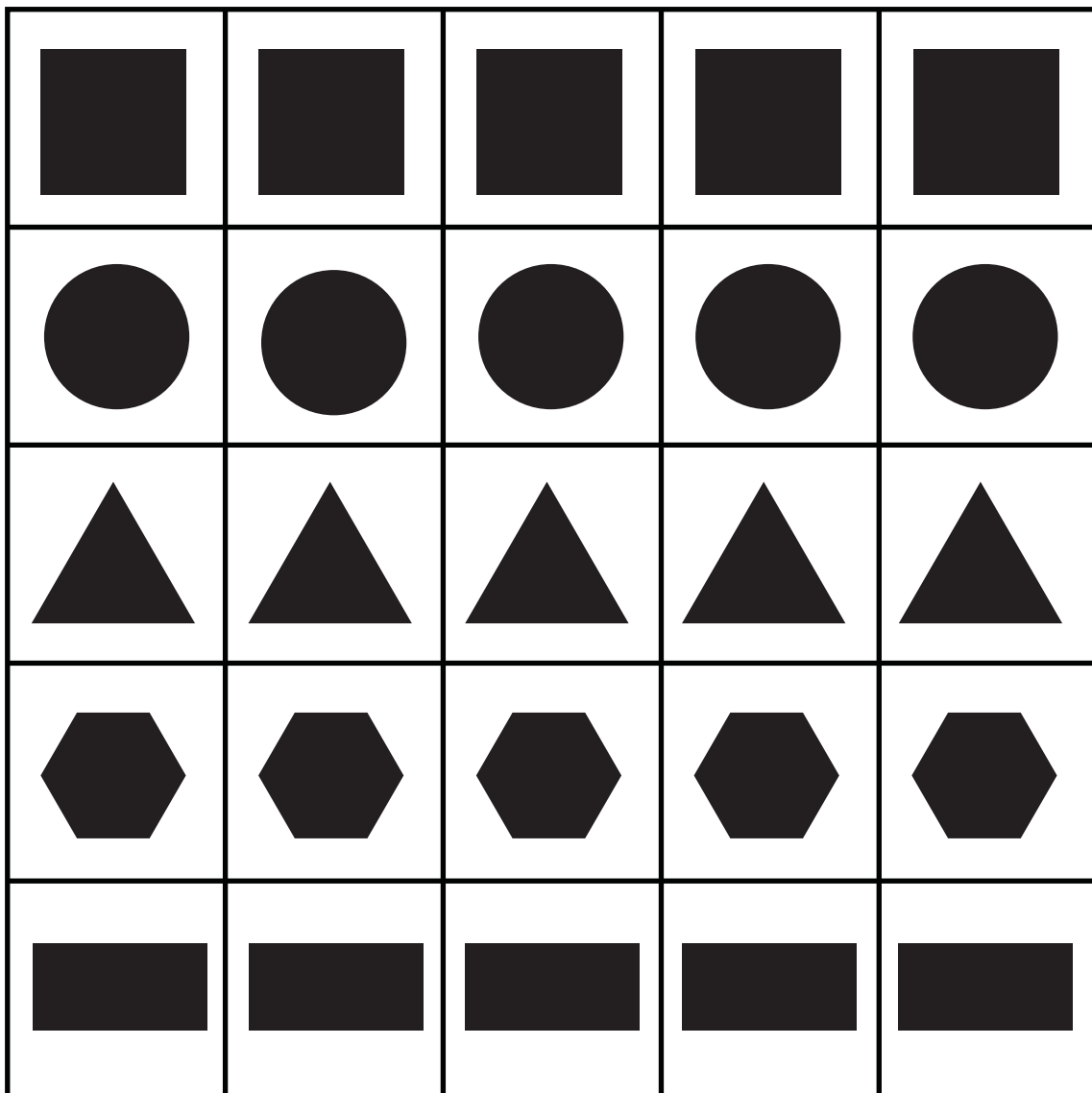
Eight pairs of numbers

Cut into 16 separate cards

1	2	2	3	3	4
4	5	5	6	6	7
7	8	8	9	9	10

Tile the square

Cut into 25 separate cards



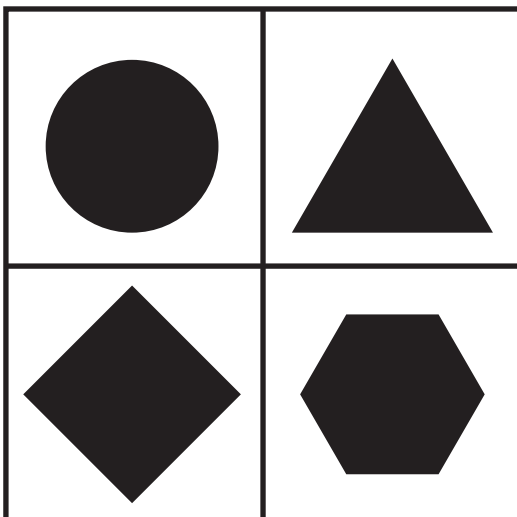
Hundred square puzzle

Cut into 13 pieces down dashed lines

51				85		87		82	
		63	94					91	
71		73				47		2	
		10	54					11	13
				65		67		22	
78					76			31	
		90		5		7		42	
98					16			29	
58				25		27	38		40
	69		34		36			49	

Shapes in a grid

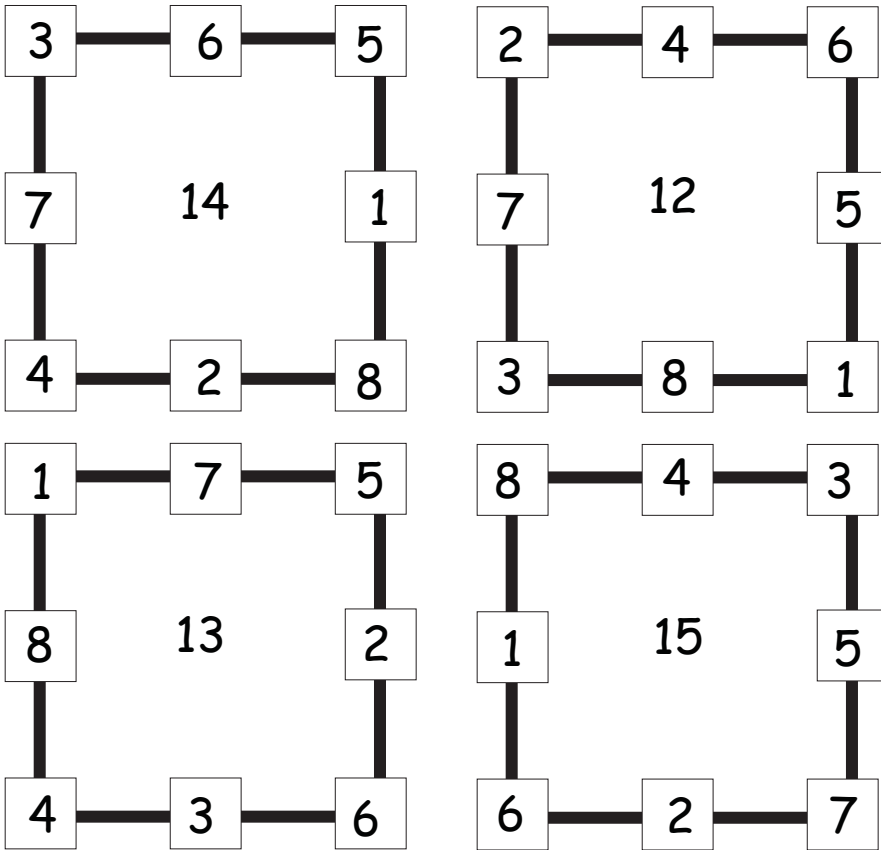
Cut into 4 separate cards



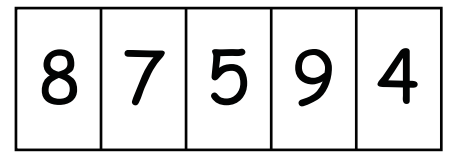
Three add to a hundred Cut into 12 separate cards

10	20	42	86
6	16	30	83
5	14	29	73

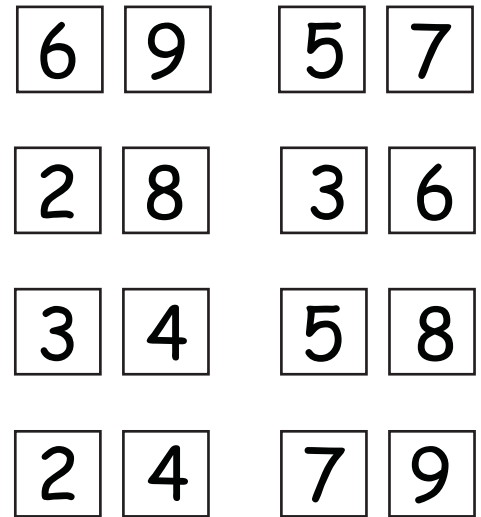
Numbers round a square
Solution



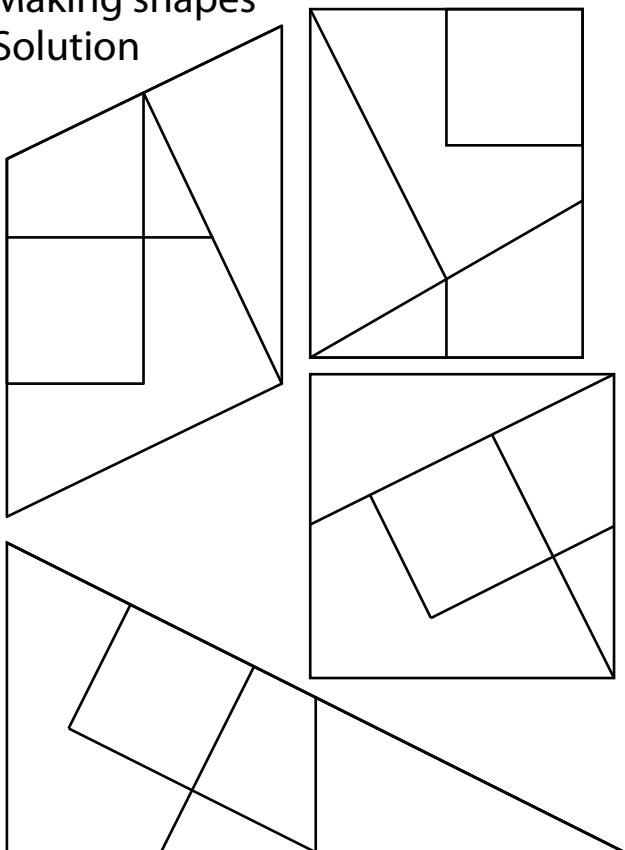
Ben's cards
Solution



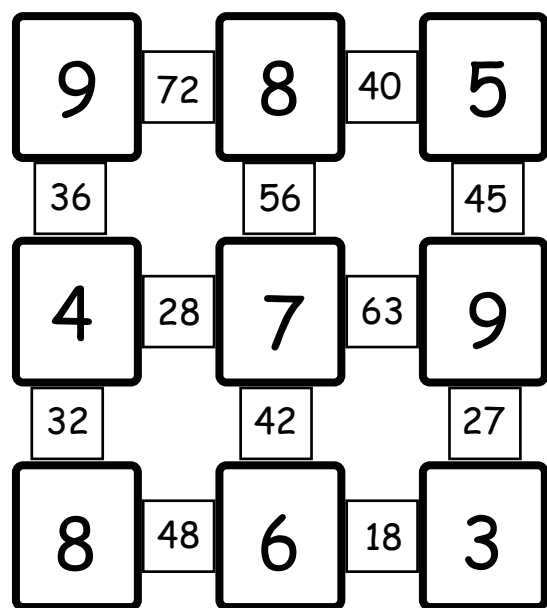
Eight pairs of numbers
Solution



Making shapes
Solution



How well do you know your tables?
Solution



Hundred square puzzle
Solution

	2		5	7		10	
11		13		16			
	22		25	27		29	
31		34		36		38	40
	42				47	49	
51		54			58		
		63		65	67	69	
71		73		76		78	
	82		85	87		90	
91		94			98		

Three add to a hundred
Solution

$$\boxed{28} + \boxed{30} + \boxed{42} = \boxed{100}$$

$$\boxed{64} + \boxed{16} + \boxed{20} = \boxed{100}$$

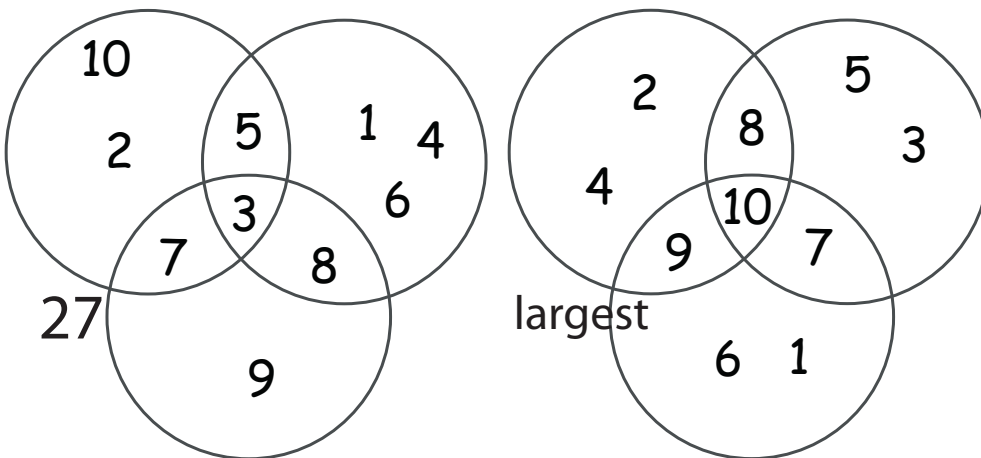
$$\boxed{57} + \boxed{14} + \boxed{29} = \boxed{100}$$

$$\boxed{21} + \boxed{6} + \boxed{73} = \boxed{100}$$

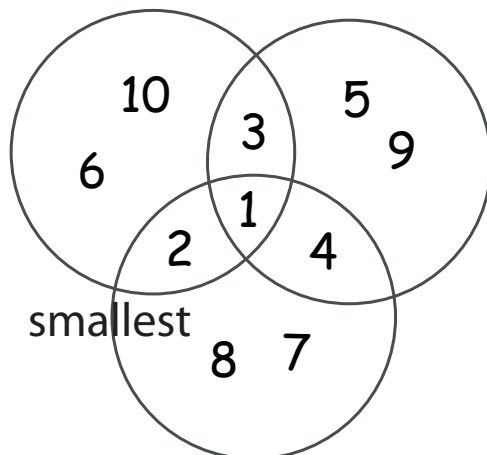
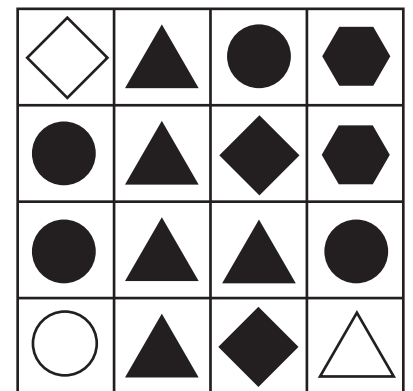
$$\boxed{7} + \boxed{10} + \boxed{83} = \boxed{100}$$

$$\boxed{9} + \boxed{5} + \boxed{86} = \boxed{100}$$

Numbers in circles
Solutions



Shapes in a grid
Solution



Tile the square
a solution

