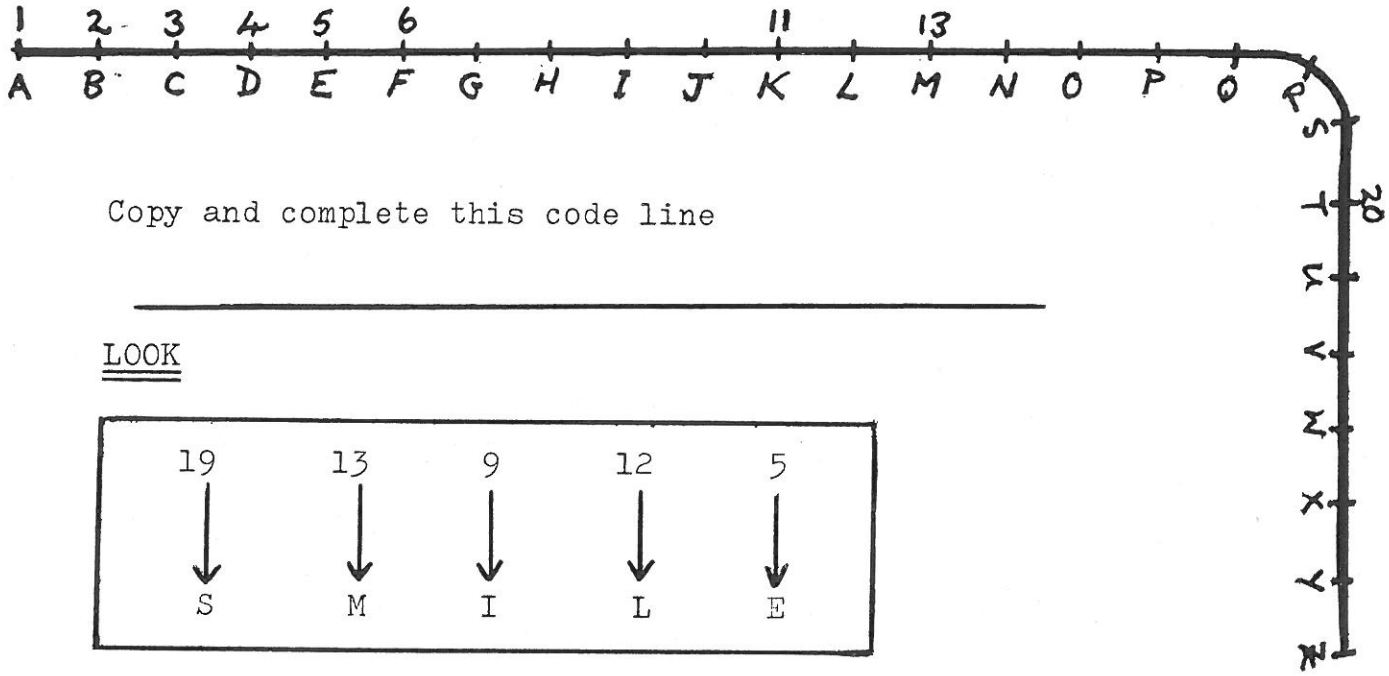
SMILE WORKCARDS

Mappings Pack One

Contents

A Secret Code



Copy and complete this code line

_____

LOOK

Here are some secret messages.
What do they say?

(1) | 13 | 5 | 5 | 20 | | 13 | 5 | | 20 | 15 | 4 | 1 | 25 |

(2) | 3 | 1 | 12 | 12 | | 20 | 8 | 5 | | 16 | 15 | 12 | 9 | 3 | 5 |

(3) | 20 | 8 | 5 | | 7 | 15 | 12 | 4 | | 9 | 19 | | 2 | 25 | | 20 | 8 | 5 |
| 20 | 18 | 5 | 5 |

(4) | 7 | 15 | | 20 | 15 | | 20 | 8 | 5 | | 8 | 21 | 20 | | 1 | 20 |
| 20 | 5 | 14 |

(5) | 9 | | 1 | 13 | | 14 | 15 | 23 | | 1 | | 3 | 15 | 4 | 5 |
| 2 | 18 | 5 | 1 | 11 | 5 | 18 | | 7 | 18 | 1 | 4 | 5 |
| 15 | 14 | 5 |

Now make up a message of your own. Try it on your friend.

ilea
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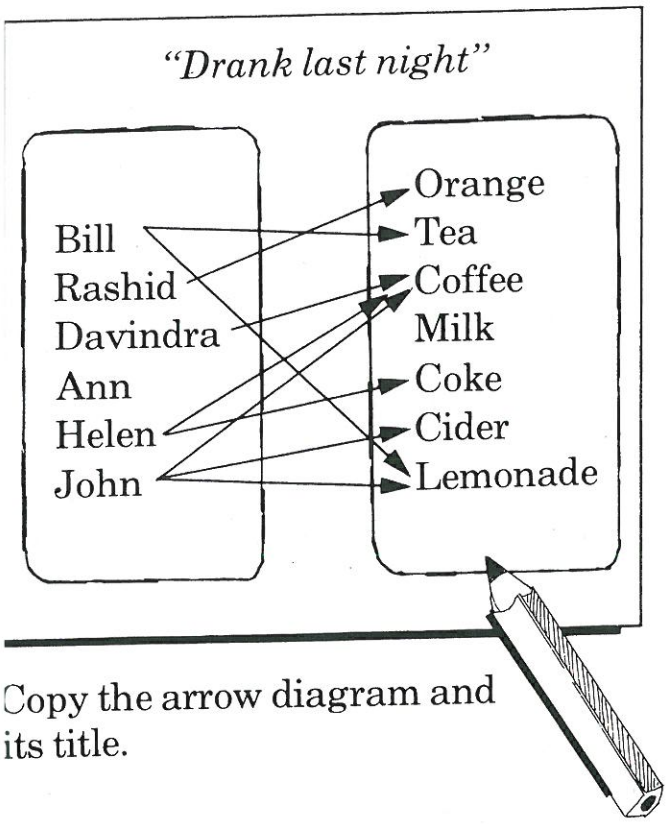
Smile **0171**

TV Drinks

This arrow shows which drinks people chose last night.



Copy the arrow diagram and its title.

1. Rashid drank orange. What did Davindra drink?
2. John had 3 drinks. What were they?
3. Who drank cider?
4. Who drank lemonade?
5. Who drank nothing?
6. Which drink was the most popular?
7. Which drink was the least popular?
8. Who had 2 drinks?
9. Who had the most drinks?
10. Which drink did John and Bill both have?

TURN OVER

In your book draw an arrow diagram for TV programmes which your friends *like to watch.*

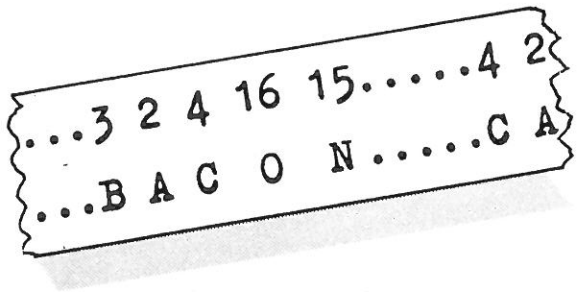
In one loop write the names of about 5 or 6 friends.

In the other loop write 5 or 6 TV programmes

Ask your friends which programmes they like to watch.

Draw the arrows.

CRACKING THE CODE



Someone has found part of a secret code together with the message.

She decided to write out a table.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

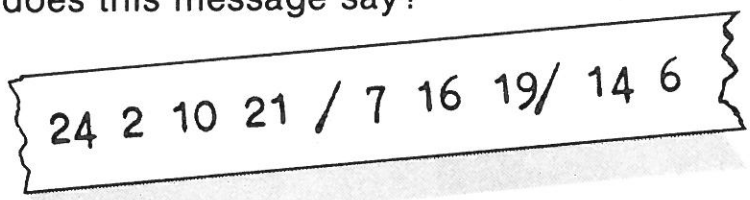
(a) Copy the table.

(b) She saw that **B** was **3** and that **A** was **2.**
Write 3 under B; write 2 under A.

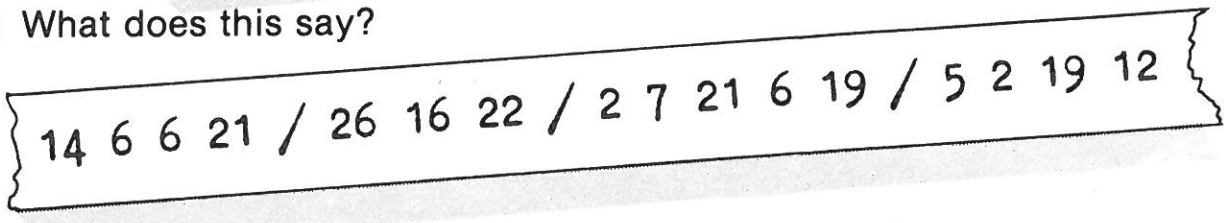
(c) Write in the other numbers you can see in the message.

(d) Finish the table using the numbers 1 to 26.

1) What does this message say?



2) What does this say?



3) Now put this into code.

HIDE FROM THE ROBBERS

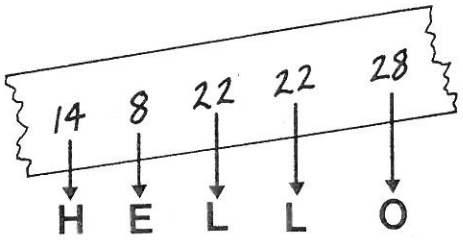
4) Put this into code.

COME TO THE ZOO

An even code

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

This message says "Hello"



What do these messages say?

1. 40 36 8 ..... 38 14 8 ..... 4 28 6 8

2. 20 8 8 30 ..... 36 24 16 22 16 26 12

3. 38 44 28 ..... 0 26 6 ..... 38 44 28 ..... 24 0 20 8 ..... 10 28 40 34

4. 16 ..... 4 0 26 ..... 40 36 8 ..... 38 14 8 ..... 8 42 8 26 ..... 4 28 6 8

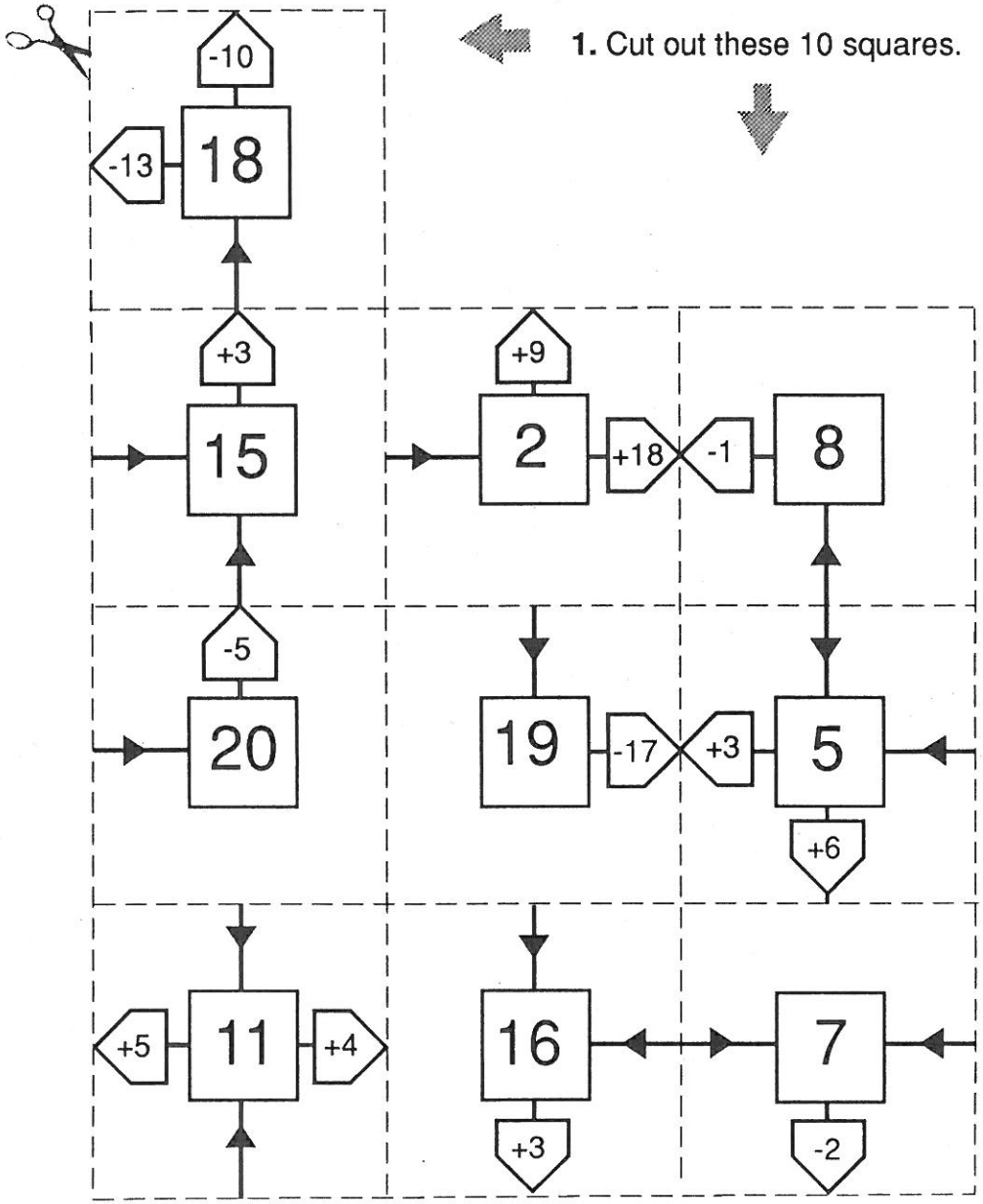
5. 8 42 8 26 ..... 26 40 24 2 8 34 36 .....

0 34 8 ..... 0 22 22 ..... 24 40 22 38 16 30 22 8 36 .....

28 10 ..... 38 44 28

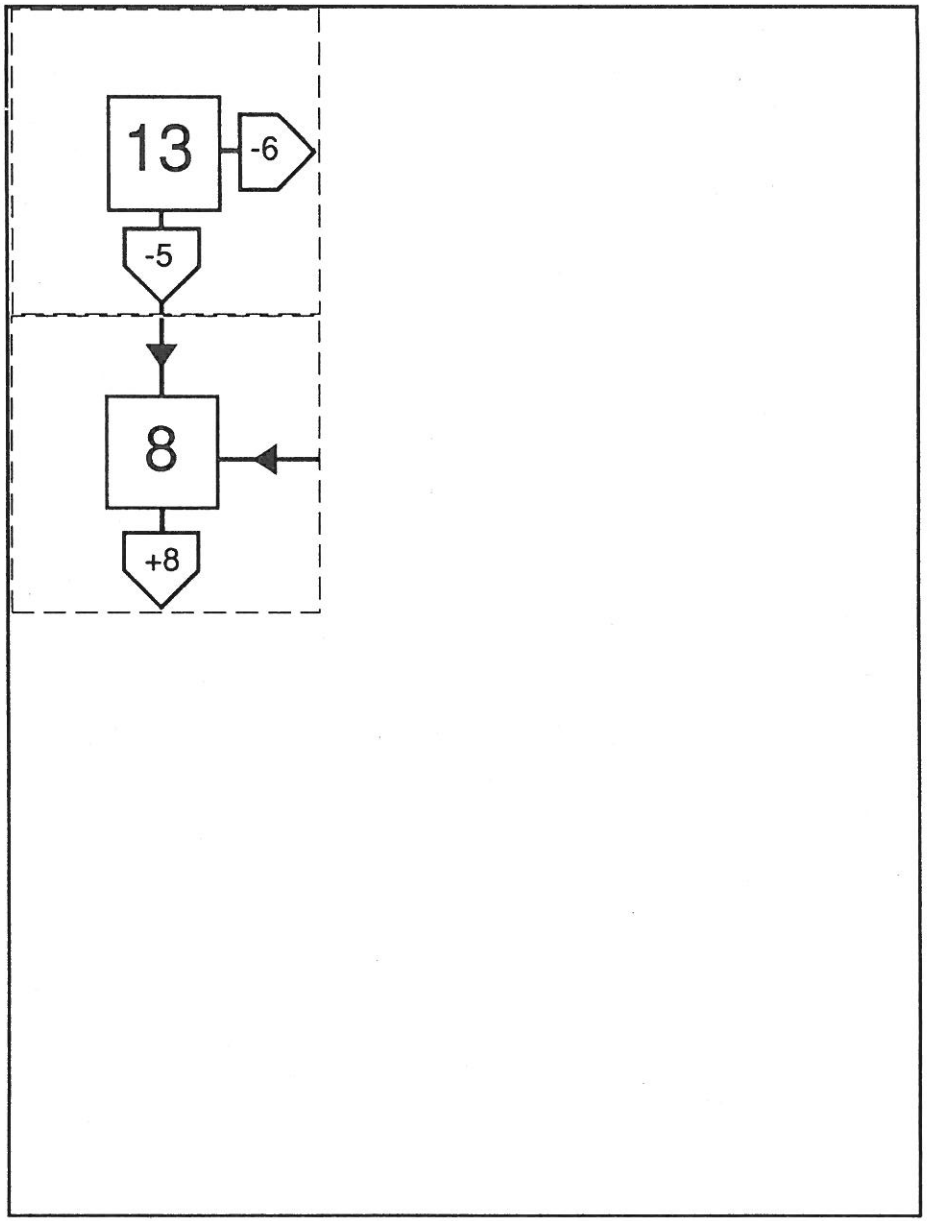
Mapping Jigsaw

1. Cut out these 10 squares.



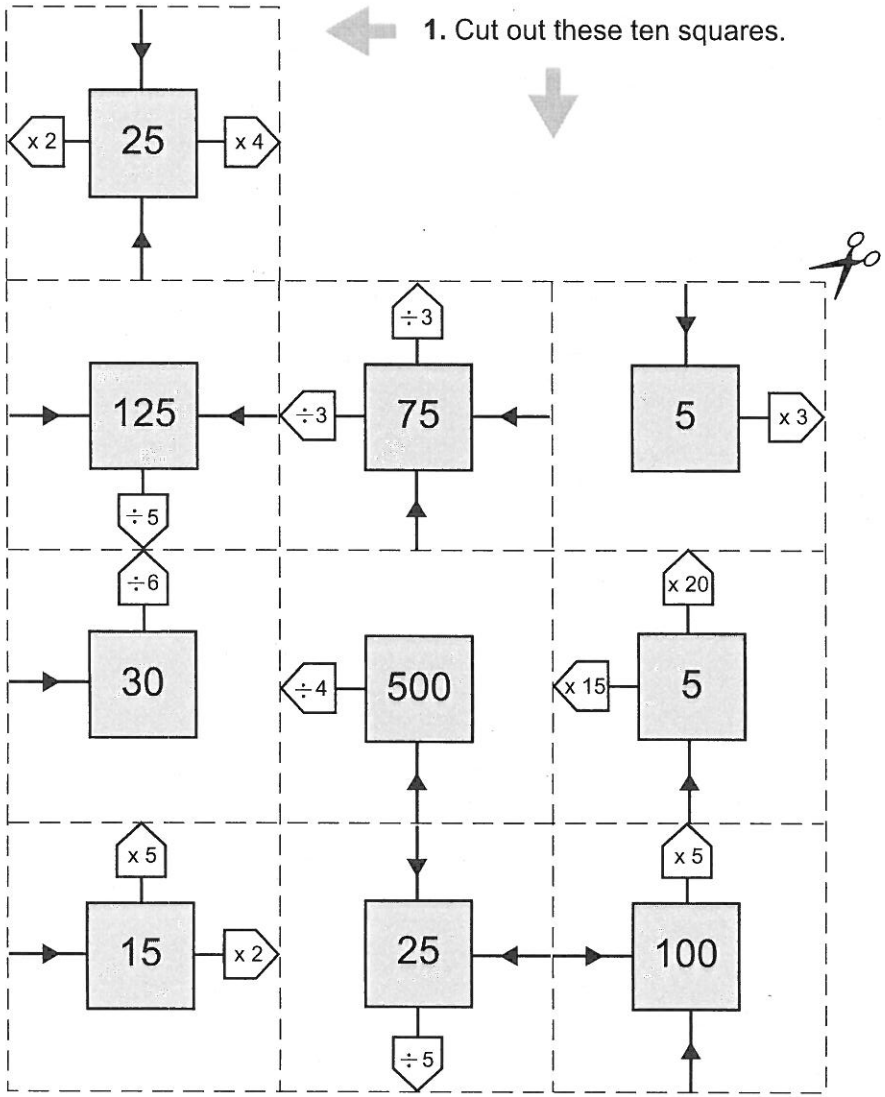
2. Fit them into this rectangle.
Two pieces are started for you.

Check with someone else before you stick them down.



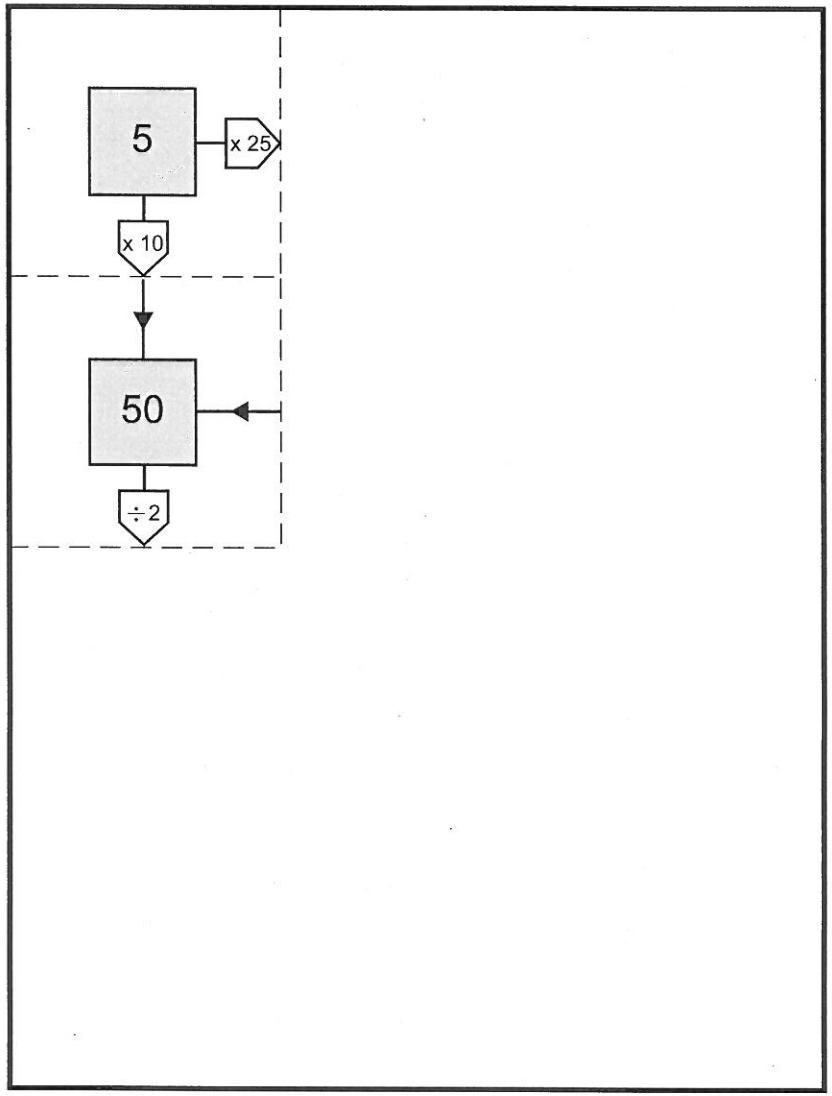
Mapping Rectangles

1. Cut out these ten squares.



2. Fit them into this rectangle.
Two pieces are started for you.

Check with someone else before you stick them down.



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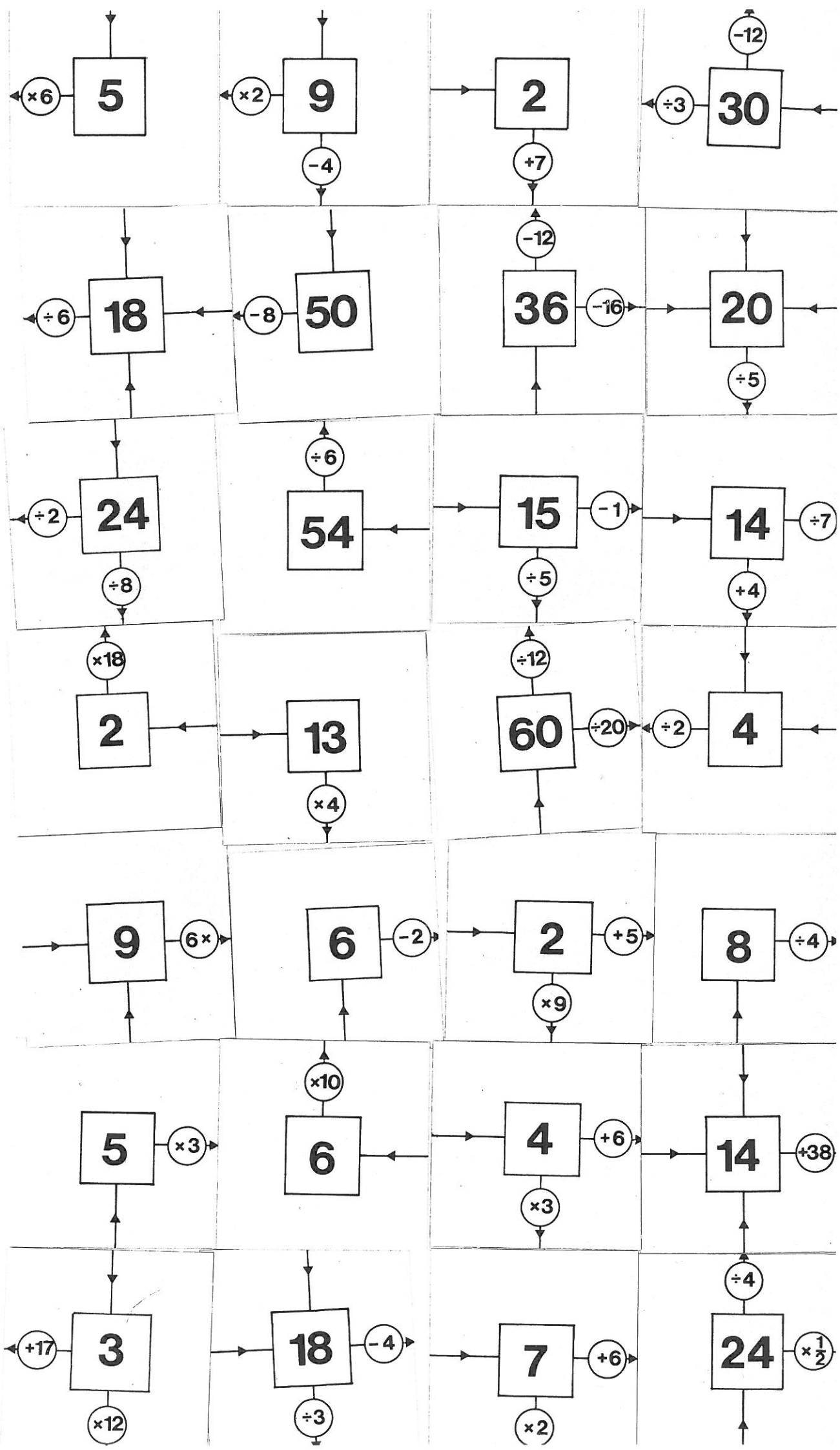
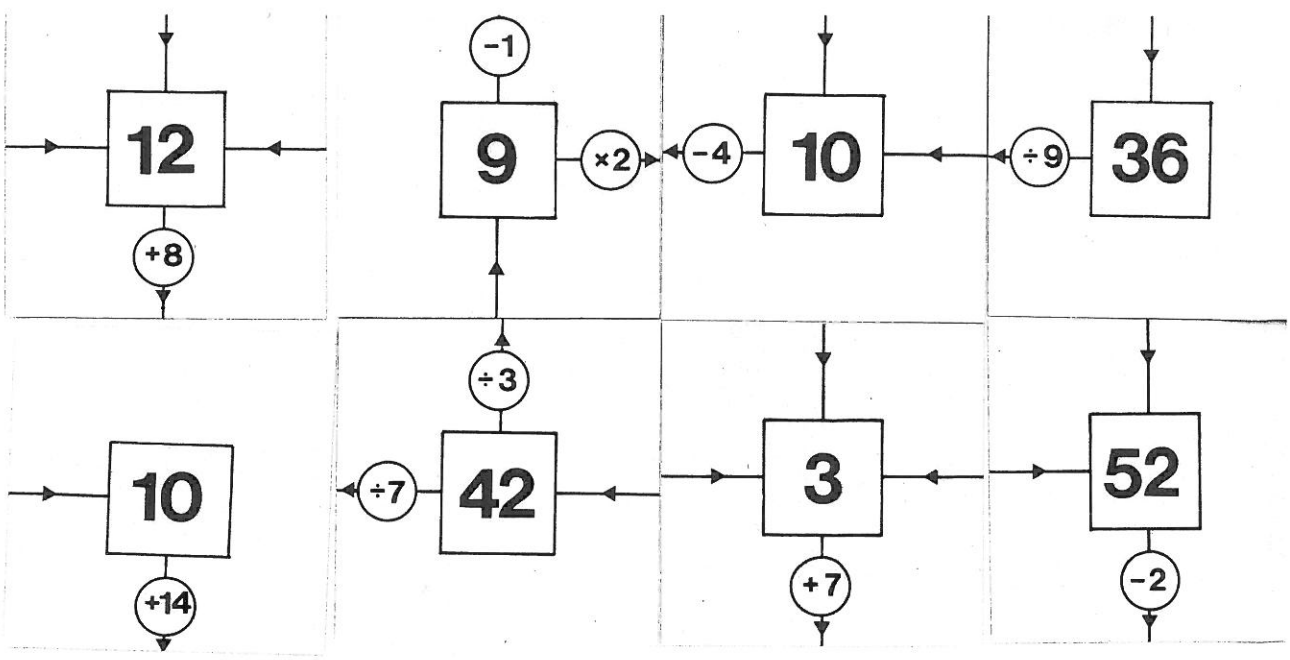
Smile 1668

Mapping Puzzle

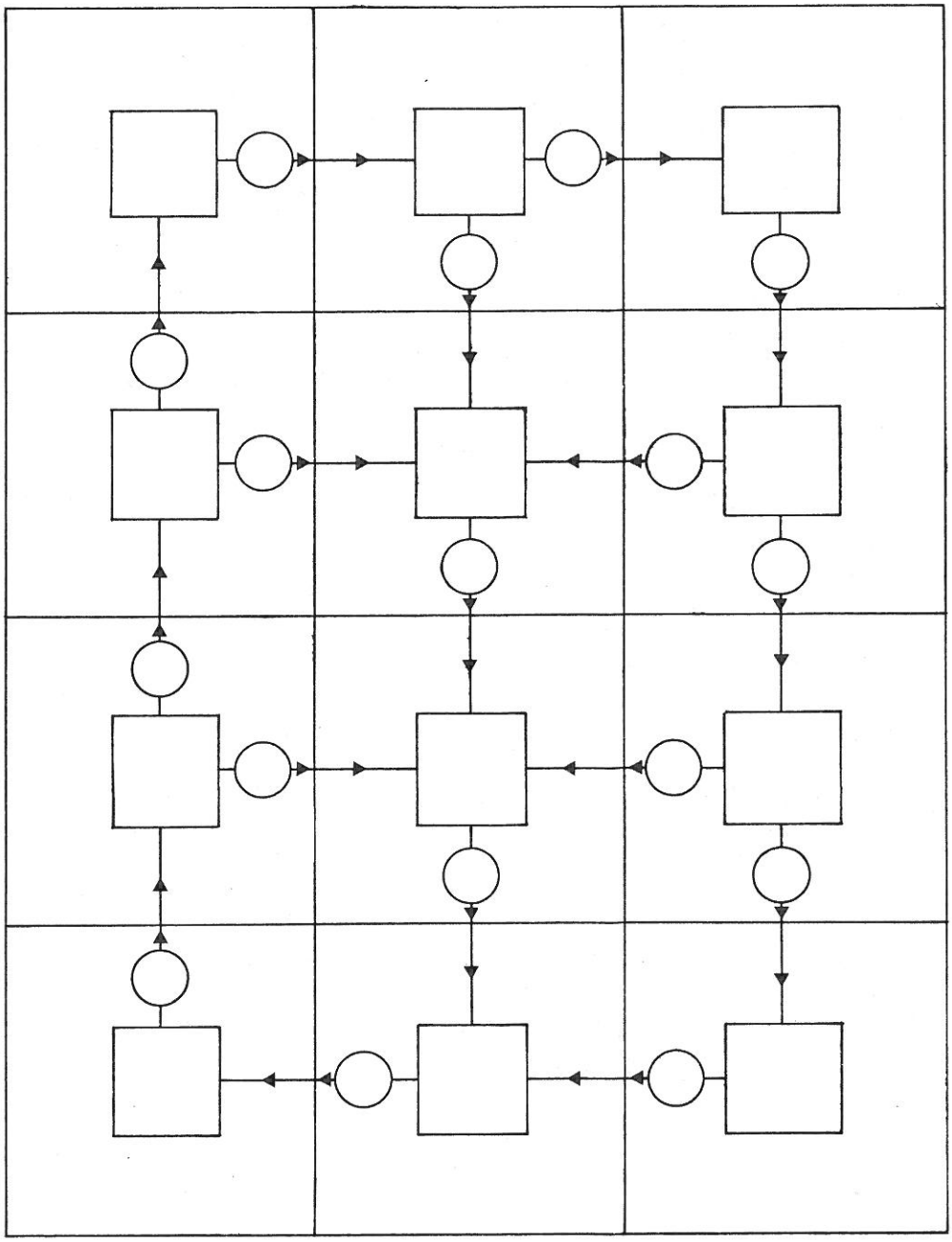
When you have solved the numbers jigsaw, use worksheet 1668A to invent one of your own.


5
×6
9
×2
−4
2
+7
30
÷3
−12
18
÷6
50
−8
36
−12
−16
20
÷5
24
÷2
÷8
54
÷6
15
−1
÷5
14
÷7
+4
2
×18
13
×4
60
÷12
÷20
÷2
4
9
6×
6
−2
2
+5
×9
8
÷4
5
×3
6
×10
4
+6
×3
14
+38
3
+17
×12
18
−4
÷3
7
+6
×2
24
÷4
×½


12
+8
-1
9
×2
-4
10
÷9
36
10
+14
÷3
÷7
42
3
+7
52
-2

Mapping Puzzle

Smile Worksheet 1668A



Think of a number

Is the answer always 1?

Try it with other numbers to find out.
Try it on a friend.

Here is a new game.

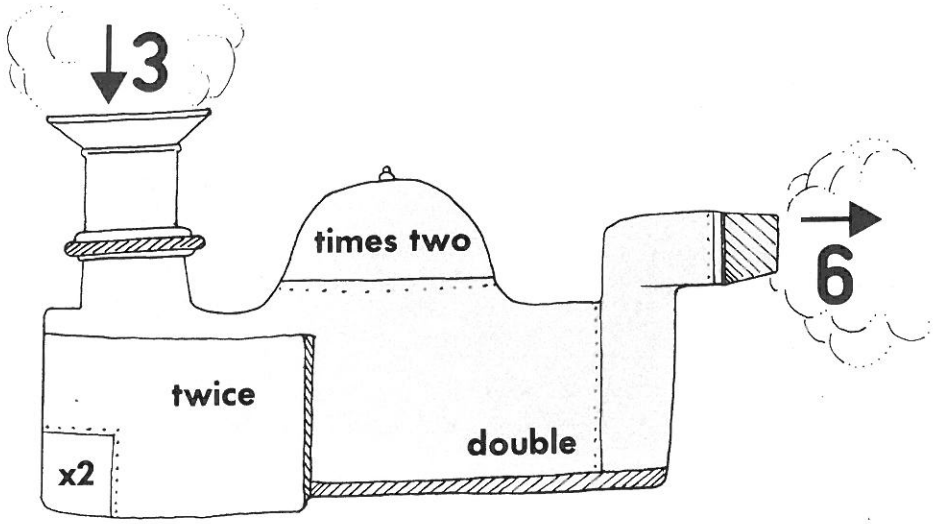
What number does it finish on?

Can you invent a game like this?

Think of a number
Add 2
Multiply by 3
Subtract 6
Divide by 3
Subtract the number you first thought of

Mapping Machines

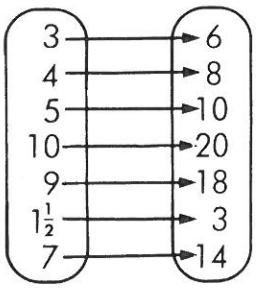
Smile **0173**



This is a 'Double' machine.

(1) When 4 goes in, what comes out?
(2) If 20 comes out, what went in?

Double



This diagram shows what the machine does to some numbers.

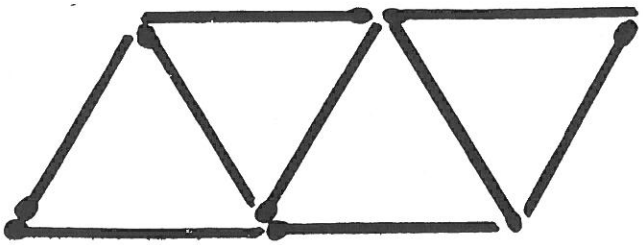
Draw another diagram to show what it does to some different numbers.

Draw different diagrams to show what happens to 3, 4, 5 and some other numbers when you use:-

(a) A 'treble' (x 3) machine
(b) An 'add seven' machine
(c) A 'subtract two' machine
(d) A 'multiply by five and then add three' machine

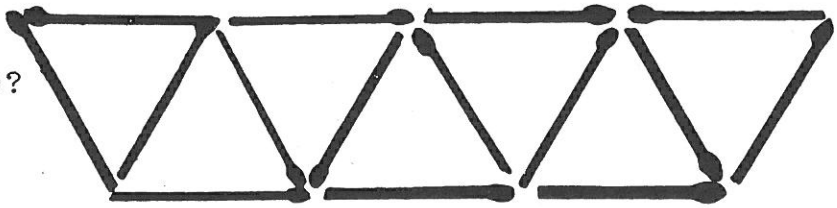
You will need: matches

A Match For Anyone



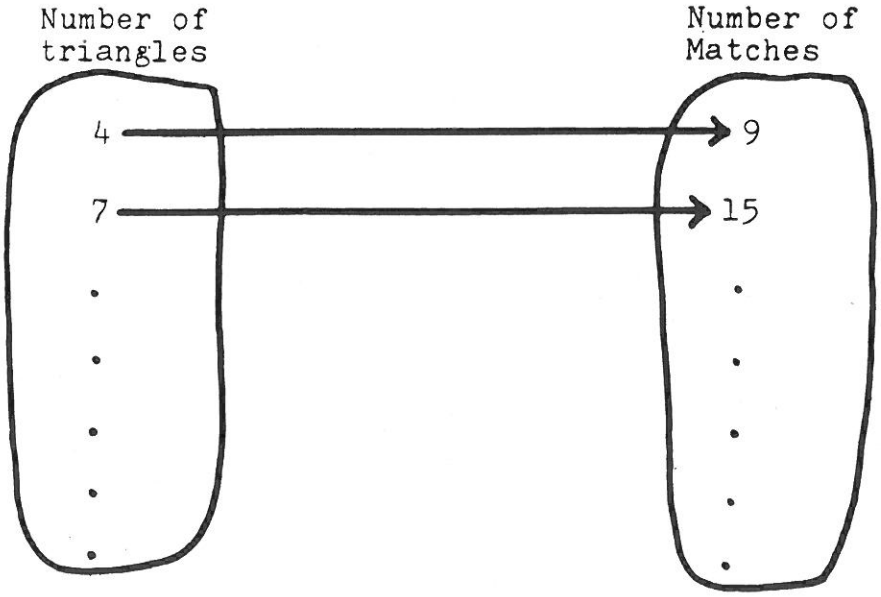
Make this pattern with matches.
How many triangles are there?
How many matches?

Now how many triangles?
How many matches?



Make about 5 more patterns which make a single row of triangles like these.
Each time draw the pattern, write how many triangles and also how many matches.

Make an arrow diagram like this one for your results.



Can you spot a rule?

Turn over

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Perhaps you noticed that:-

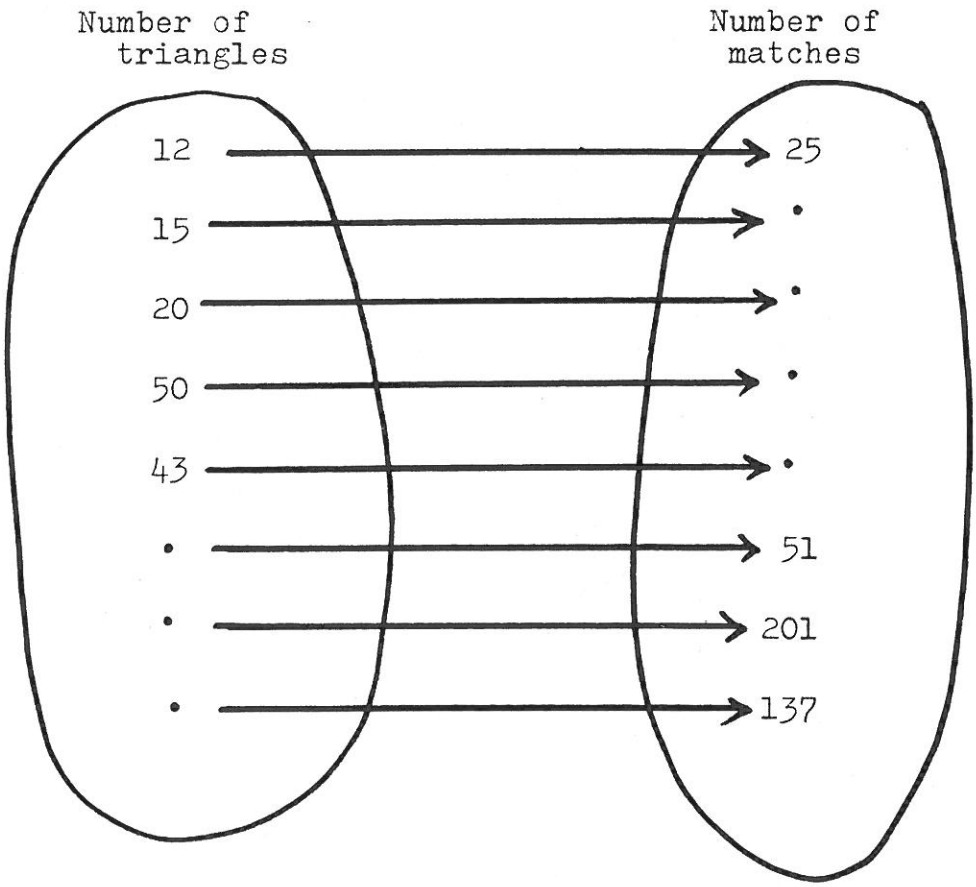
Double 4 + 1 = 9

Double 7 + 1 = 15

. . .

This should work for all your pairs of numbers.
Check that it does.

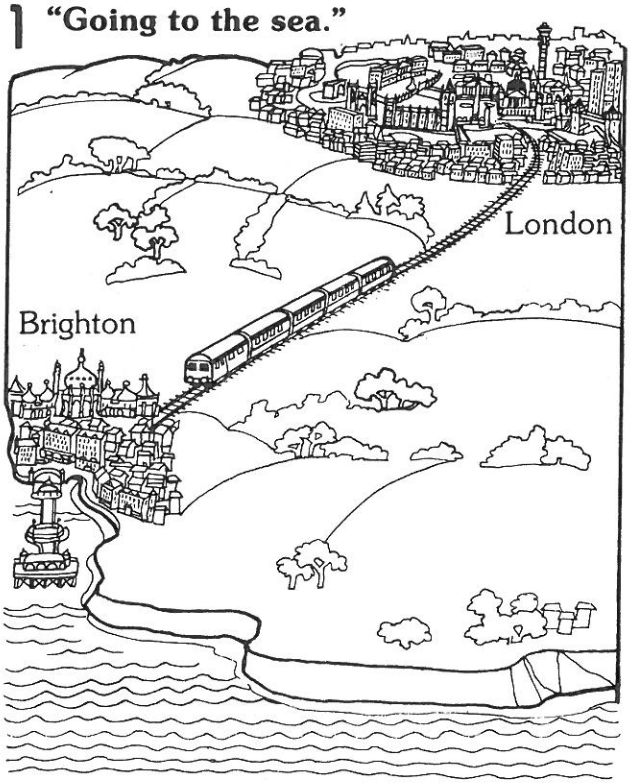
Use your rule to complete this (without matches, if you can) :



The Inverse

The inverse of an operation takes you back to where you started.

1 **"Going to the sea."**

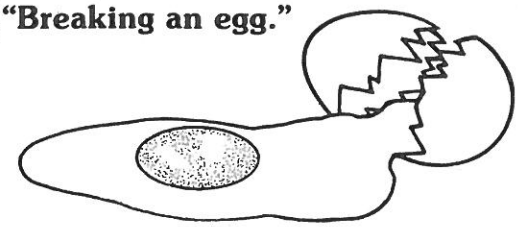


Is there an inverse? What is it?

2 **"Borrowing a £1."**

What is the inverse?

3 **"Breaking an egg."**



Is there an inverse?

Do the following have inverses? If so what are they?

4 Pumping up a tyre

5 Adding 6 to a number

6 Pouring out a cup of tea

7 Turning clockwise through an angle of 60°

8 Lighting a match

9 Dividing a number by 2

10 Turning an empty mug upside down

11 Turning a full mug upside down

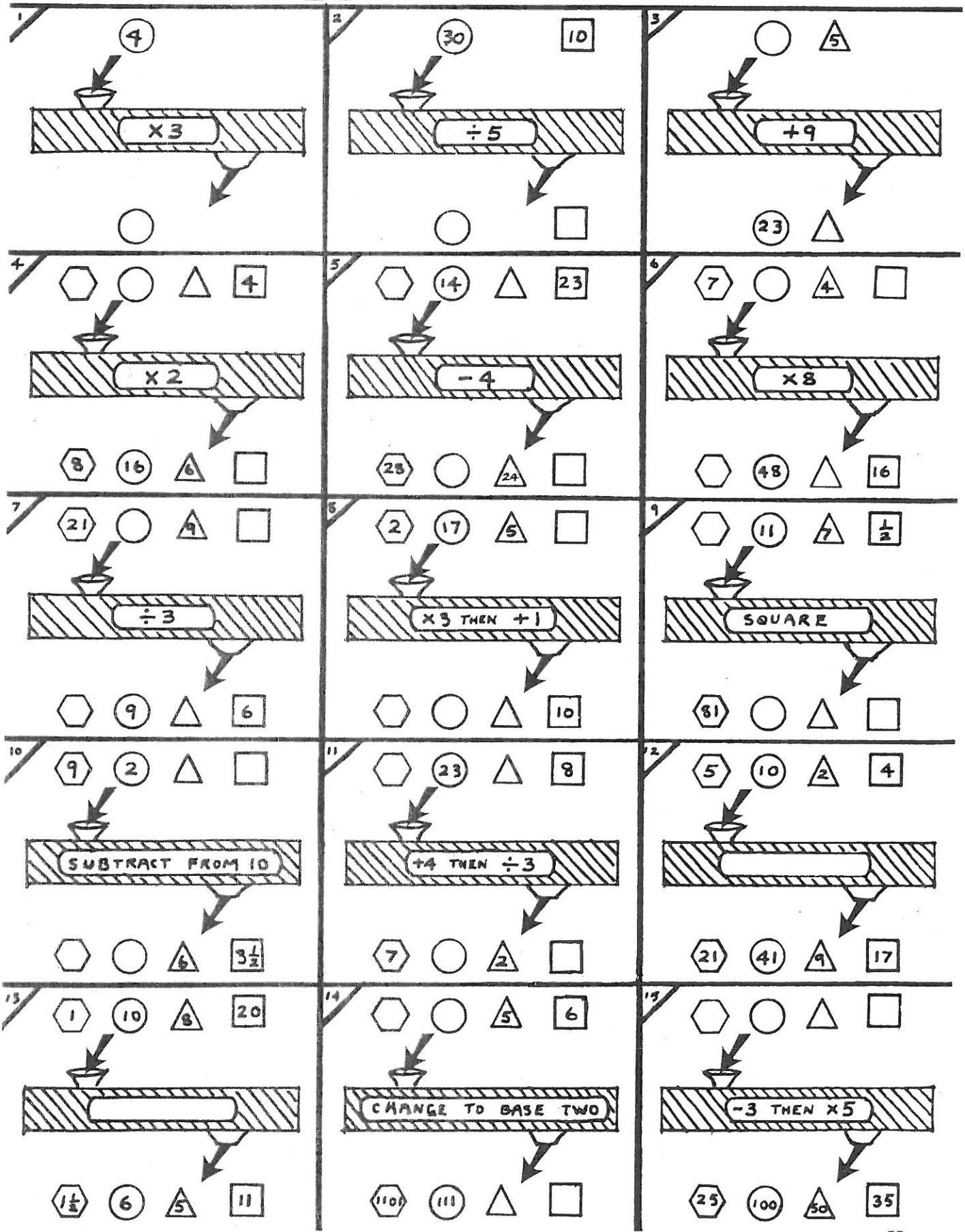
12 Multiplying a number by 0

13 Make up your own list of operations. Which ones have inverses? What are the inverses?

smile

0476

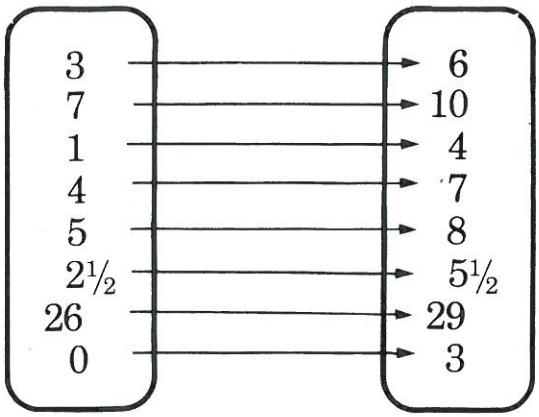
Mapping Worksheet



ilea

Alf, Mike or Leena?

What sort of mapping machine was used to get this diagram?



Alf looked at the first pair of numbers.
3 ⟶ 6
He said "Double 3 is 6. It must be a **Double** machine."

Mike looked at
7 ⟶ 10
He said "It's got to be an **Add Three** machine."

Leena looked at
1 ⟶ 4
"You're both wrong," she said. "It's a **Multiply by Four** machine."

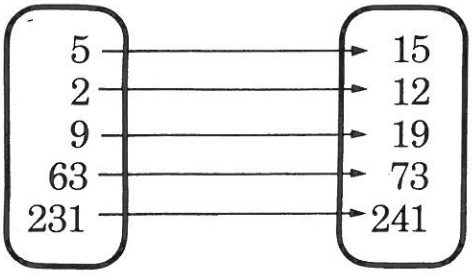
Who was right and why?

TURN OVER

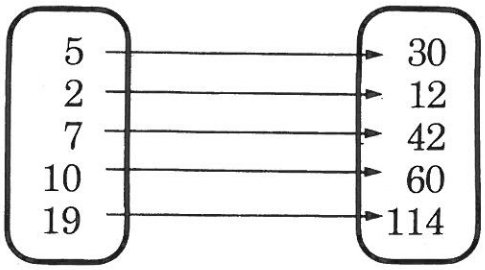
Find what sort of machines were used to do these diagrams.

Remember, in each question your machine must work for **every** pair of numbers.

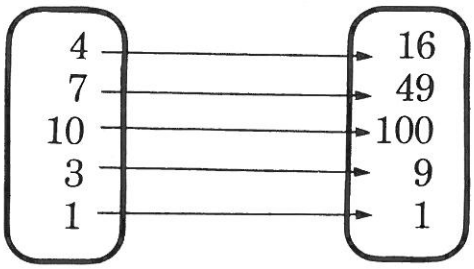
(1)



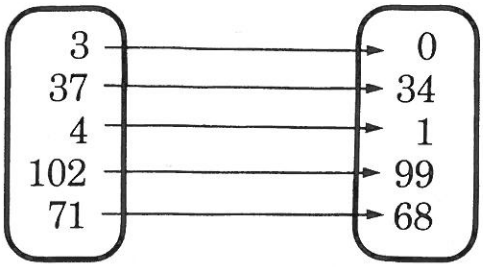
(2)



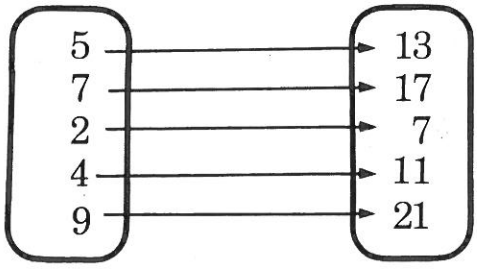
(3)



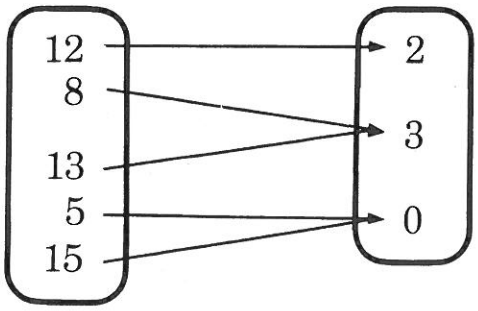
(4)



(5)



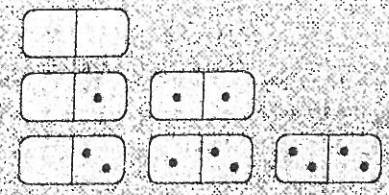
(6)



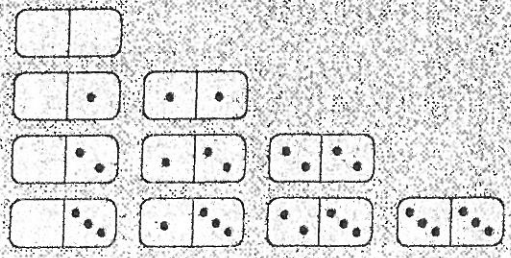
Make up some of your own and get a friend to try them.

Domino Patterns

This is a **2-SET**.
There are **6** dominoes.



This is a **3-SET**.
There are **10** dominoes.

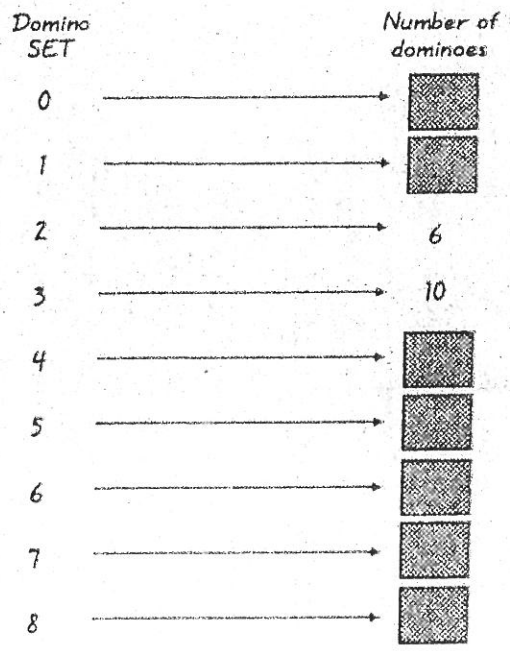


1) Draw a **4-SET**.

How many dominoes?

Turn over

2) Copy and complete this mapping.



3) Describe in words how to work out the number of dominoes.

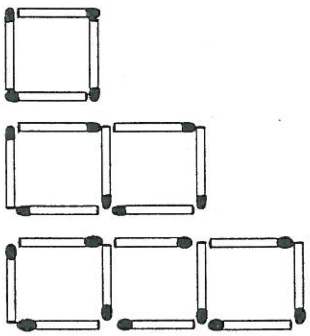
4) How many dominoes are there in the **10-SET**?

5) How many dominoes are there in the **15-SET**?

From Matches to Mappings

Example

Pattern



Mapping diagram

number of squares(s)	number of matches(m)
1	4
2	7
3	10
4	13
5	16
6	19

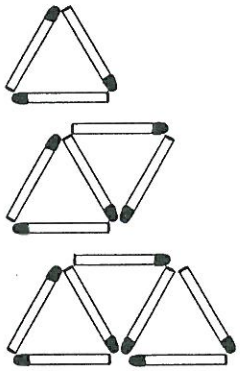
Rules and Algebra

Pattern down:	+3
Rule across:	$\times 3 + 1$
Mapping:	$s \longrightarrow 3s + 1$
Equation:	$m = 3s + 1$

Complete the following:

1

Pattern



Mapping diagram

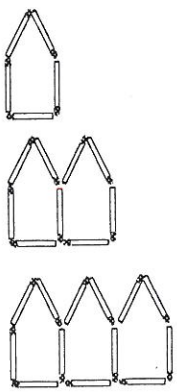
number of triangles(t)	number of matches(m)
1	3
2	5
3	
4	
5	
6	

Rules and Algebra

Pattern down:	
Rule across:	
Mapping:	$t \longrightarrow$
Equation:	$m =$

2

Pattern



Mapping diagram

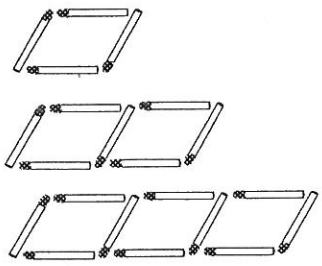
number of pentagons(p)	number of matches(m)
1	5
2	
3	
4	
5	
6	

Rules and Algebra

Pattern down:	
Rule across:	
Mapping:	$p \longrightarrow$
Equation:	$m =$

3

Pattern



Mapping diagram

number of parallelograms(p)	number of matches(m)
1	4
2	
3	
4	
5	
6	

Rules and Algebra

Pattern down:

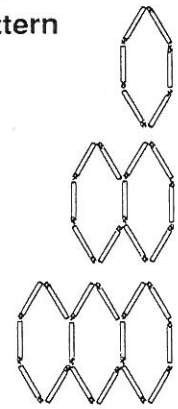
Rule across:

Mapping:

Equation:

4

Pattern



Mapping diagram

number of hexagons	number of matches
1	6
2	
3	
4	
5	
6	

Rules and Algebra

Pattern down:

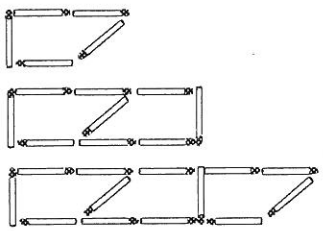
Rule across:

Mapping:

Equation:

5

Pattern



Mapping diagram

number of trapezia	number of matches
1	5
2	
3	
4	
5	
6	

Rules and Algebra

Pattern down:

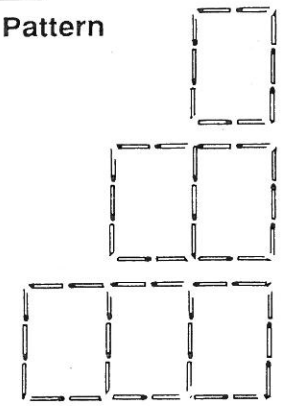
Rule across:

Mapping:

Equation:

6

Pattern



Mapping diagram

number of rectangles	number of matches
1	10
2	
3	
4	
5	
6	

Rules and Algebra

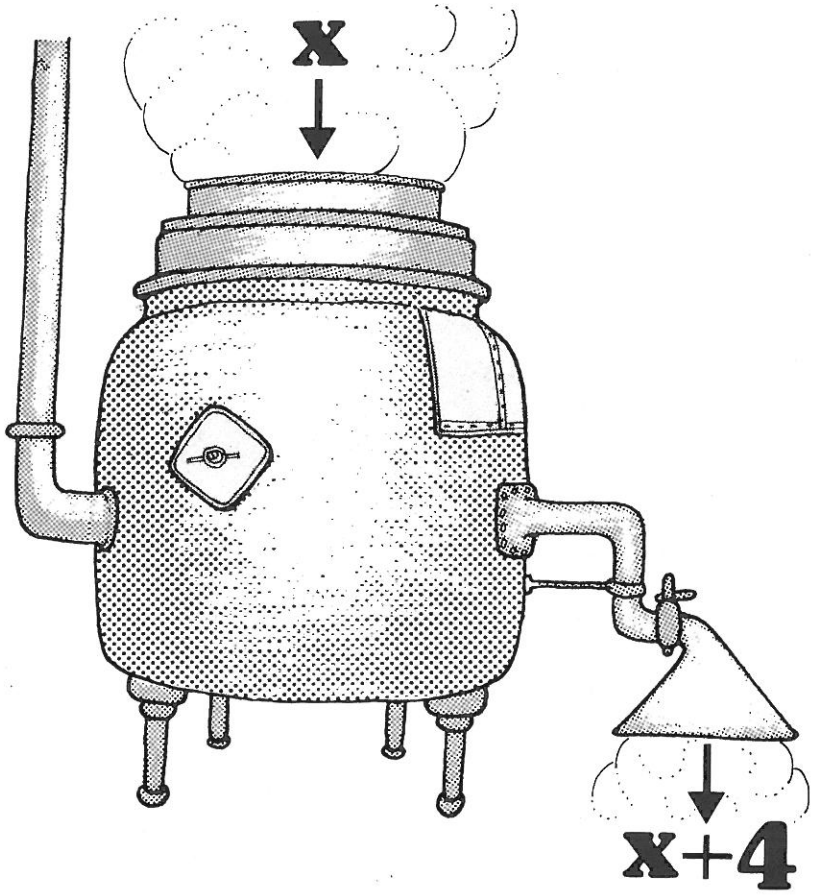
Pattern down:

Rule across:

Mapping:

Equation:

x for breakfast



What sort of machine do you think this is? (**x** can be any number you like.)

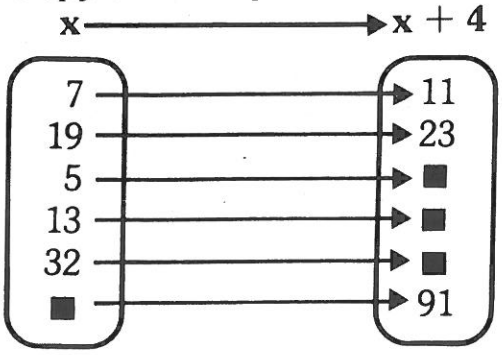
The drawing says that if **x** goes into the machine, then **x** + **4** comes out.

So if 7 goes in then 7 + 4 comes out,
i.e. 11 comes out.

And if 19 goes in, then 19 + 4 comes out,
i.e. 23 comes out.

x → **x** + **4**
is just a neat way to say:
use an add four machine.

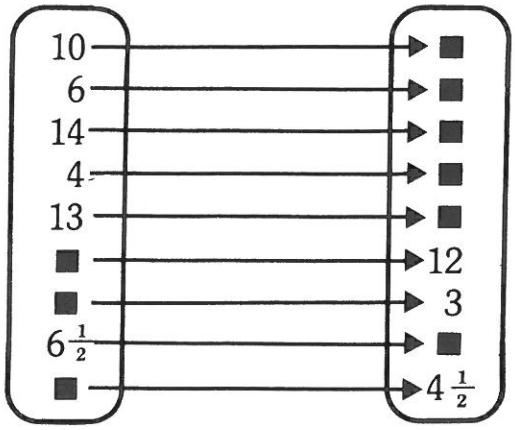
Copy and complete:



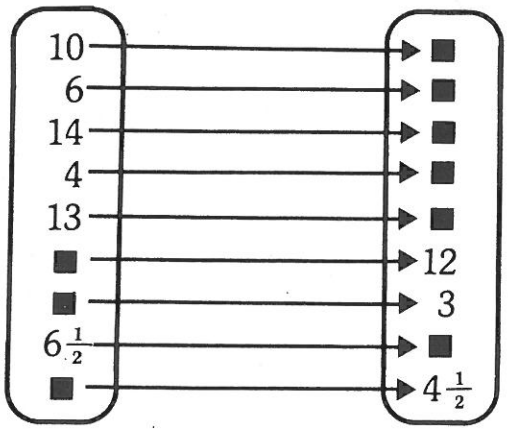
Turn over

Copy and complete the arrow diagrams for these mappings:

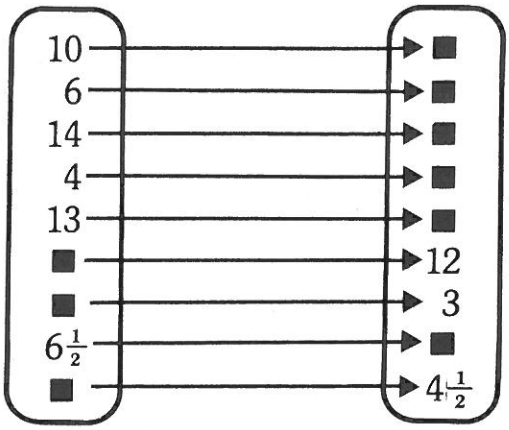
(a) $x \longrightarrow x + 2$



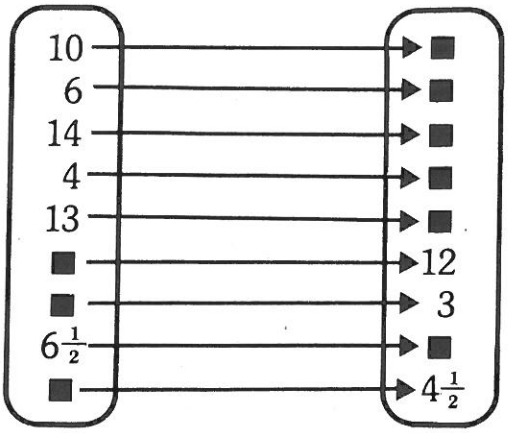
(b) $x \longrightarrow x - 6$



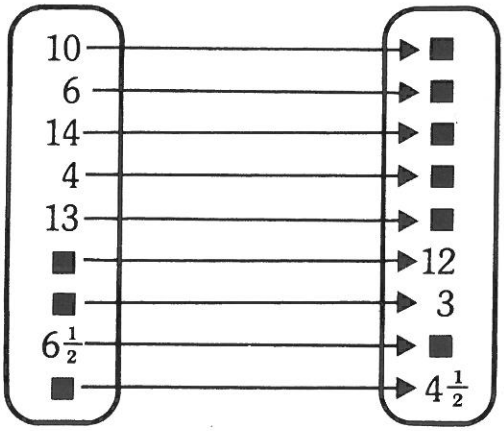
(a) $x \longrightarrow 2x$



(d) $x \longrightarrow 3x$



(e) $x \longrightarrow x \div 2$



(f) $x \longrightarrow 3x + 3$