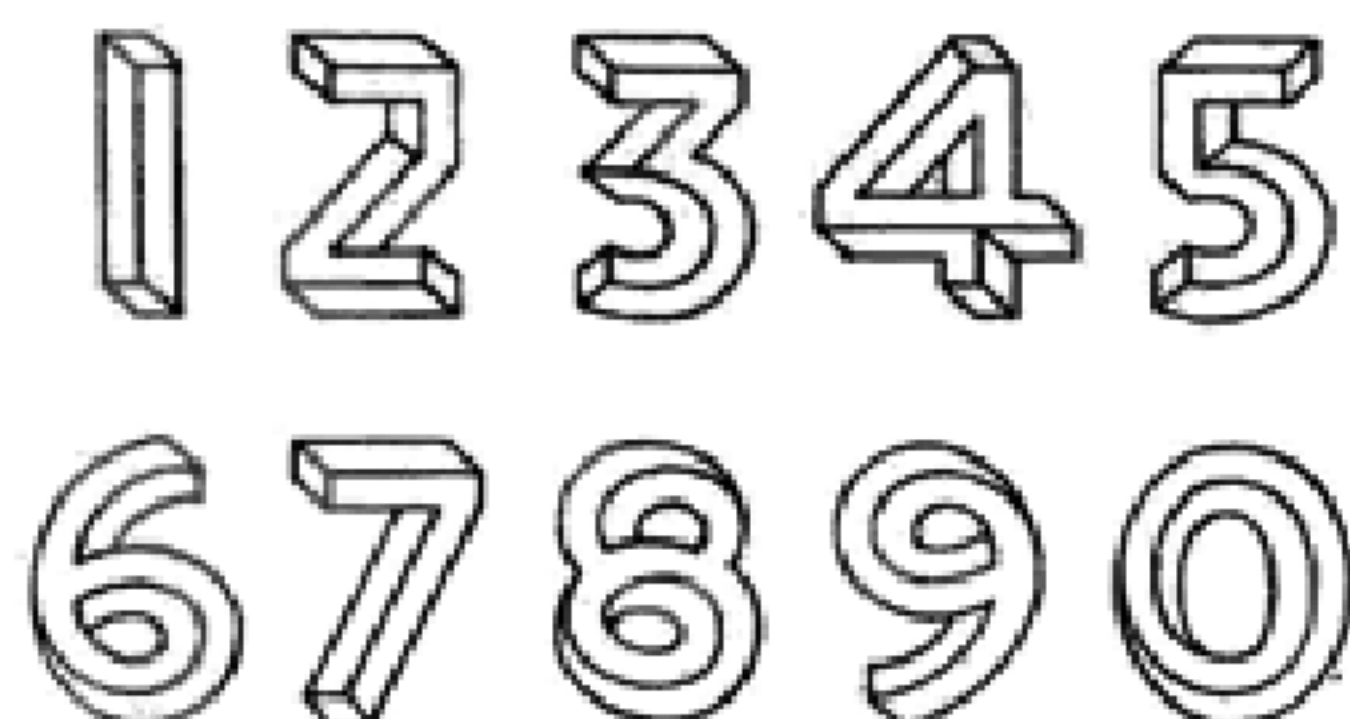
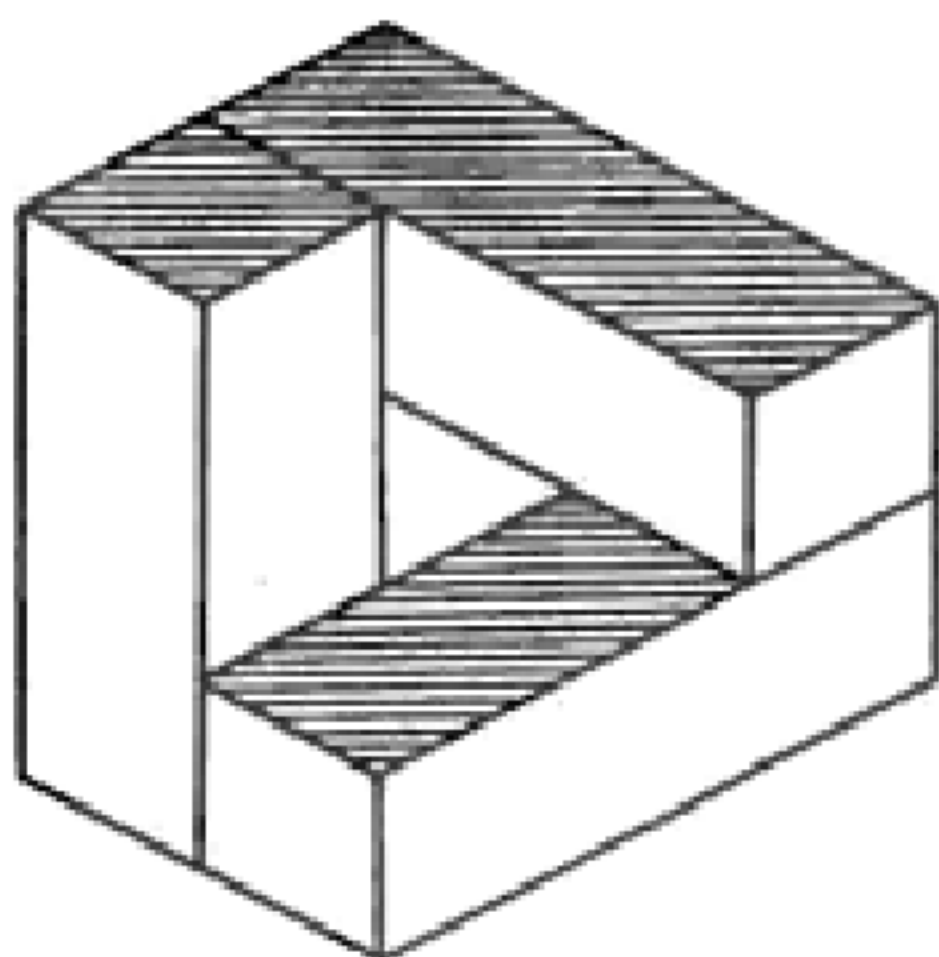
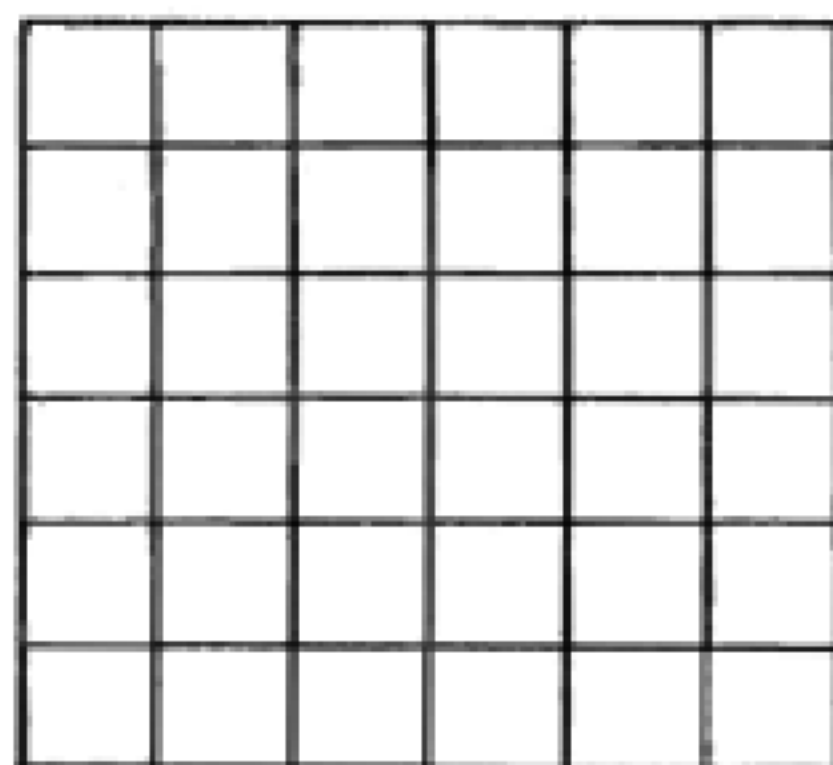


M.C.Escher, the former Dutch artist, based many of his unusual pictures on the impossible three-dimensional triangle shown below left. Shuttl. , our artist, has used the same idea to produce the unusual figures shown on the right below.

 43×25

$\begin{array}{r} 4 \ 3 \\ 2 \ 5 \end{array}$ $3 \times 5 = 15$ put down 5 and carry 1 5
 $\begin{array}{r} 4 \ 3 \\ 2 \ 5 \end{array}$ $4 \times 5 = 20$
 $\begin{array}{r} 4 \ 3 \\ 2 \ 5 \end{array}$ $2 \times 3 = 6$
 add 1 $\frac{1}{27}$ put down 7 and carry 2 75
 $\begin{array}{r} 4 \ 3 \\ 2 \ 5 \end{array}$ $4 \times 2 = 8$
 $\begin{array}{r} 4 \ 3 \\ 2 \ 5 \end{array}$ add 2 $\frac{2}{10}$ put down 10 1075



submitted by
R. L. Kenyon, Aigburth, Liverpool.

On the 6 by 6 square grid on the left, colour 12 squares so that no row, column nor diagonal has more than two coloured squares in it.



MATHEMATICAL PIE

No. 88

**Editorial Address : West View,
Flyways, Nr. Warwick**

AUTUMN, 1979

15th March 1979

Dear C.V.G.,
Reflections? (number 86). How misleading
when rotations are being given a whirl!

Take HEED! When we DECIDED to enter this field we

CHECKED out many words & found the language BEDECKED

with reflections both vertical & horizontal from M to T
and from DECODED to OX-HIDE

Some enthusiastic 2nd formers came up with



MAXIMUM TOMATO

TOO WHITE TO OWN
TOO WHITE TO OWN

and

M	M
U	U
M	M
M	M
Y	Y



whilst others turned up $\frac{\text{DICE}}{\text{DICE}}$  

Thank you for triggering off
some truly reflective moments!

Susan Rescorla

PYTHAGORAS RECALLED

It is a well known fact that a triangle with sides in the ratio of 3 to 4 to 5 is a right-angled triangle. The next well known triad of this kind is 5, 12 and 13.

What is the shortest piece of string that can be formed into shapes of either triangle whose sides have an integral number of centimetres?

B.A.

STEP IT OUT

Two young brothers take steps of length 12 cm and 30 cm. If they start walking together, how far do they travel before they both step on the ground at the same point?

B.A.

Can you see any resemblance between the two problems above? Ed.

HIGH POWERED

Divide the tenth power of 9 by the ninth power of the same number and multiply the quotient by the number whose square root is equal to its cube root.

R.H.C.

It's a dog's life!

1 cat has 1 life

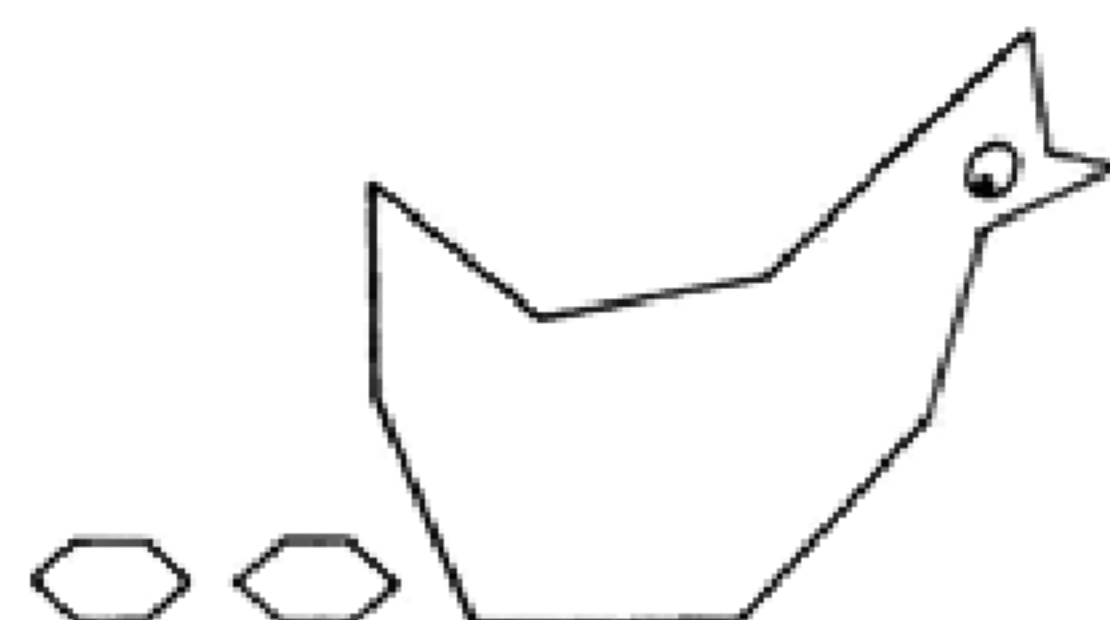
0 cat has 8 lives

adding

1 cat has 9 lives

R.H.C.

IN A BASKET?



It has only recently come to my notice that a polygon with 11 edges is called a HENDECAGON.

The one on the left has just produced two eggsagons.

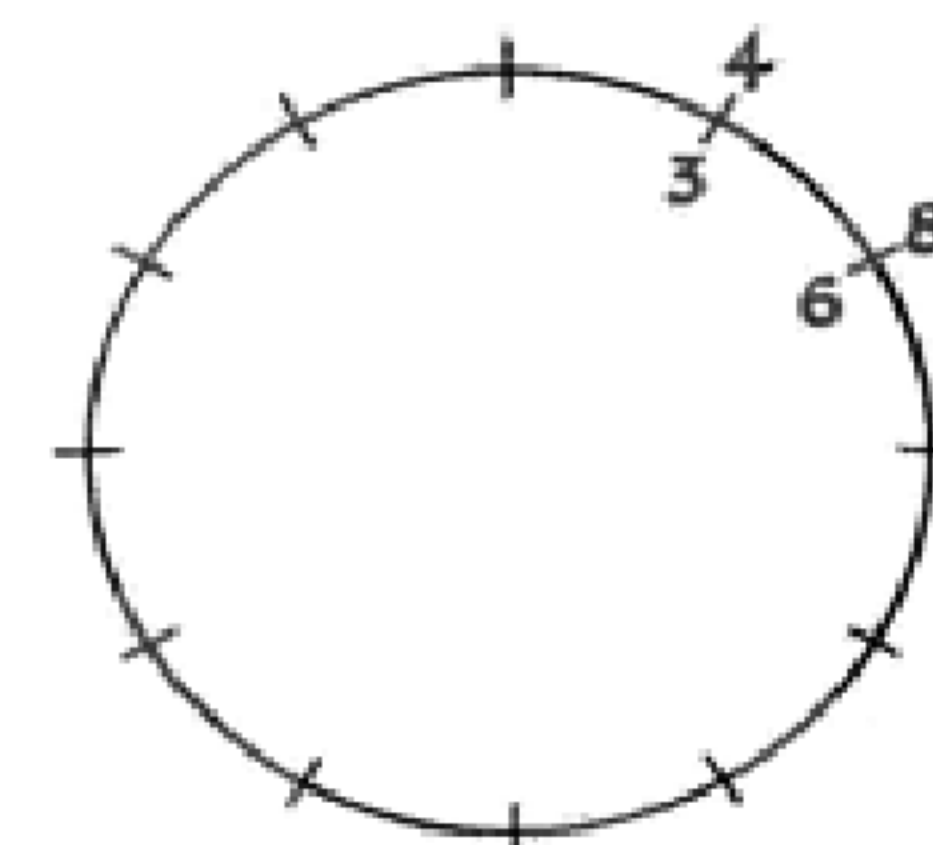
E.G.

TIME TO SPARE

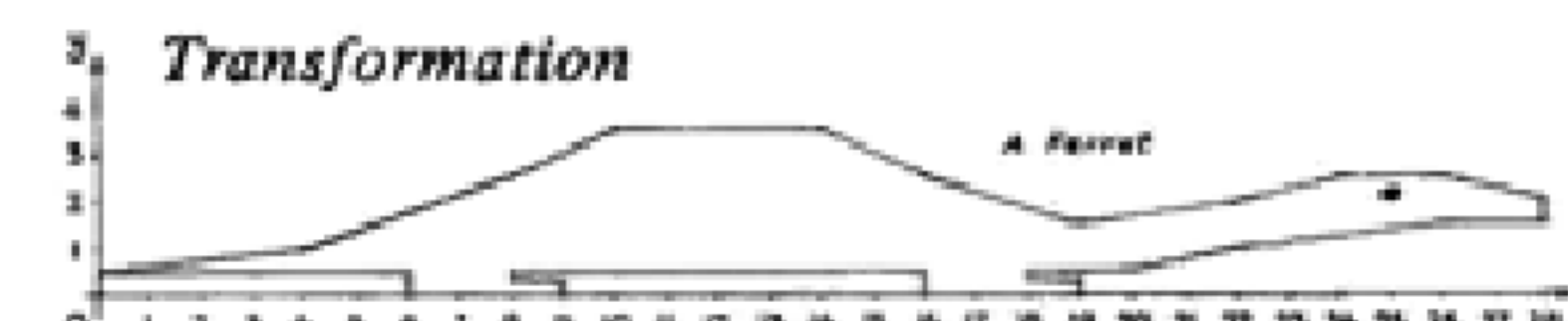
Divide a circle into 12 equal parts. Starting where 1 o'clock is, put in the multiples of 3 all round the clock. Then start again at 1 o'clock and put in the multiples of 4.

1. Subtract the smaller numbers from the larger ones and what do you get?
2. Subtract the smaller number from the larger and add the result to the larger number and what do you get?
3. Square the two numbers, add them together and take the square root and what do you get?

R.H.C.



SOLUTIONS TO PROBLEMS IN ISSUE No.87



Dennis the Menace It was, of course, last term when Dennis half filled the room.

Captain Ahab and the great white ant Taking square roots involves taking either a plus or a minus sign. The minus sign was ignored.

Money for old rope. We are confusing two quantities. The amount withdrawn and the amount left in the account. Withdrawing units of £1 each time will give the greatest discrepancy.

Just One Question Eric the ferret was the guilty party.

BILATERAL CYPHERS The message read "MATHS PIE IS FUN WATCH OUT FOR THE NEXT ISSUE".

Junior Cross Figures No.69 Clues Across: 1. 0122, 5. 2030, 6. 1454, 7. 1859
Clues Down: 1. 0211, 2. 1048, 3. 2355, 4. 2049.

The Hobbit Problem 1. 13 dwarfs, 2. 3 trolls, 3. 14 days stay in Rivendell, 4. 10 riddles, 5. 3 days spent in the Misty Mountains, 6. 4 white horses, 7. 3 day journey across Long Lake, 8. The secret door was 150 feet above the valley, 9. Area of the secret door, 5 ft. by 3 ft. was 15 square feet, 10. 5 hours march from the front door to Look-out Tower, 11. 5 armies took part in the final battle, 12. 10 dwarfs survived the battle.

Cover Up! The two problems are the same but the right hand diagram gives the easier solution by sliding the top triangle down to form a rectangle a units by c units. The sum of the areas is therefore ac square units.

B.A.

ANOTHER ROUND OF STITCHING!

Curve-stitching seems to provide an almost unlimited variety of attractive envelope patterns to illustrate mathematical relationships. For these examples, the axes, semi-circumference "c" and diameter "d", have been divided into equal parts on a sheet of stiff card.

Figure (i) illustrates the relationship $c + d = 36$. With a needle and coloured thread, "1" on the upper c-axis is mapped on to "35" on the d-axis; then "34" on the d-axis to "2" on the c-axis; and similarly around the circle until "35" on the c-axis is mapped on to "1" on the d-axis. Calculation is simplified if it is realised that values of c and d can be interchanged: $c + d = 36$ when $c = 1$, $d = 35$ and when $c = 35$, $d = 1$. Mapping in the same way from the lower c-axis to the d-axis completes the figure.

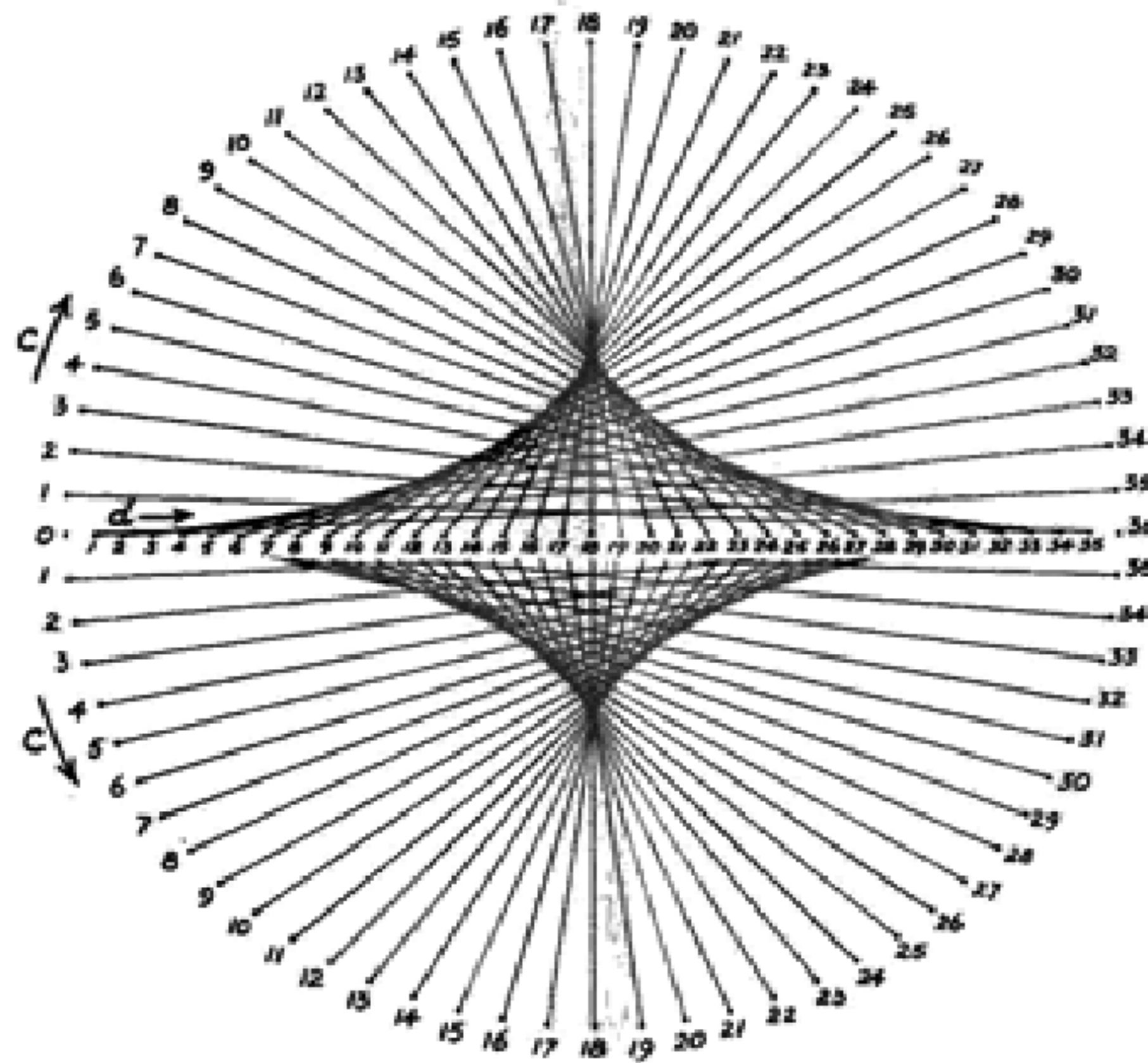


fig. (i) $c + d = 36$

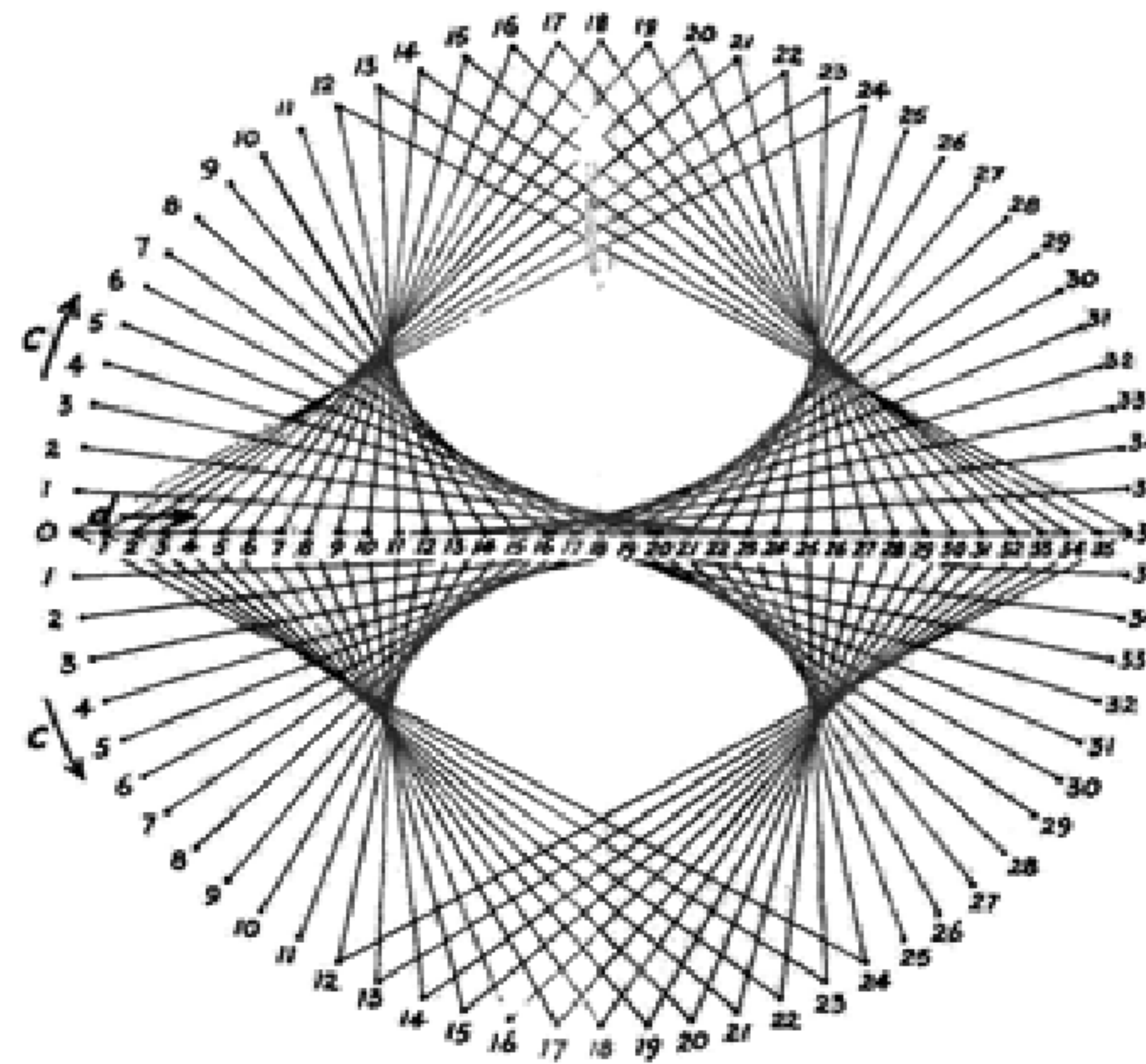


fig. (ii) $c + d = 24$ and $c + d = 48$

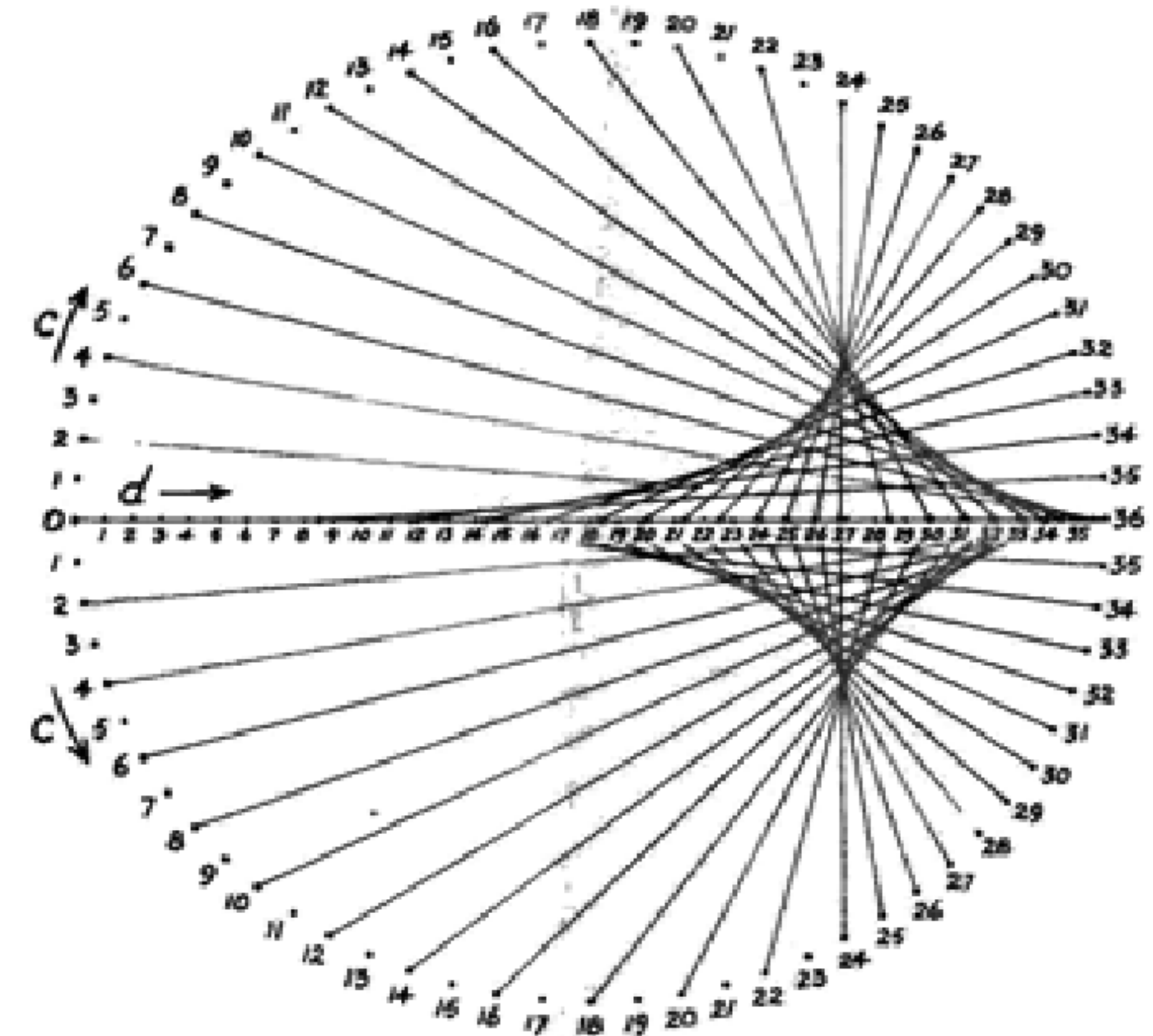


fig. (iii) $c^2 + d^2 = 36^2$

Figure (ii) illustrates $c + d = 24$ and $c + d = 48$. Readers may be interested in trying to discover what determines the vertical axis of reflective symmetry in this example, testing conclusions by stitching mappings for other pairs of equations.

In figure (iii), $c^2 + d^2 = 36^2$, d is calculated for respective values of c substituted in the equation. E.g. when $c = 22$, $22^2 + d^2 = 36^2$. Therefore, $d = \sqrt{1296 - 484} = 28.5$ and the mapping is stitched from 22 on the c-axis to 28.5 on the d-axis.

Of course, it is important to understand that the envelopes produced by the mappings do not represent the graphs of the equations.

D.I.B.

INFLATION

submitted by C. B. Atkin, Retford

Due to inflation all numbers have been increased by 100 per cent. The numbers in this story have suffered in the same way.

Twice upon two times, there was two twoderful princess and she lived with her four parents and two brother in two palace. The prince enjoyed camping and used to go away eight weekends in a twentyt. The

king had many soldiers and they lived in eightts all over the land ready four protect the king's lands.

Two weekend before Christmas, the twoderful princess was playing twentynis, the prince was in his twentyt and the soldiers were in their eightts. Everytwo was ready eight Christmas. In no time at all, it was Christmas and everytwo sixteen four much and got tummy ache. So no two lived happily ever after.