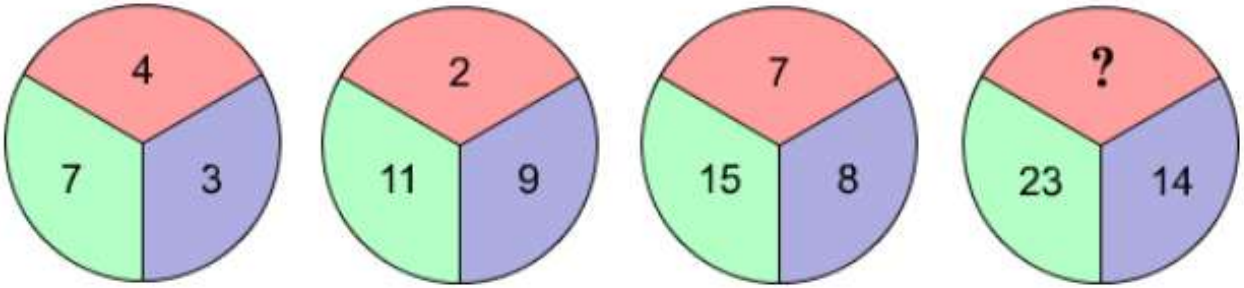
The numbers in each circle follow the same pattern.



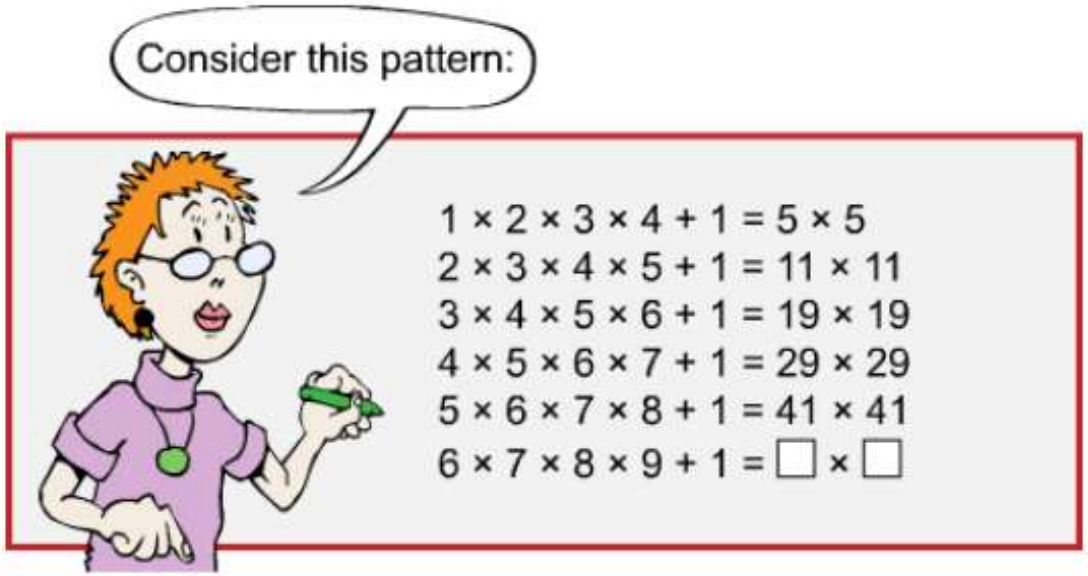
Which number completes the pattern?

- 8
- 9
- 12
- 15

126 127 129 133 141 157 ____ 253

What is the missing term from the sequence?

- 231
- 218
- 213
- 189



What number goes in both boxes?

- 53
- 55
- 57
- 59

Here is a pattern of triangles made from sticks:

The numbers of triangles and sticks are shown in the table.

Triangles	1	2	3	4
Number of sticks	3	5	7	9

If the pattern of triangles continues, how many sticks are used to make 12 triangles?

- ⬭ 25
- ⬭ 29
- ⬭ 35
- ⬭ 36

Here is a pattern of triangles made from sticks:

The numbers of triangles and sticks are shown in the table.

Triangles	1	2	3	4
Number of sticks	3	5	7	9

Sabrina has a packet holding 60 sticks.

What is the largest number of triangles that she could make using this pattern?

- 33
- 31
- 30
- 29

The students at a primary school were lined up.

At the front of the line were three boys, then three girls, then three boys and so on.

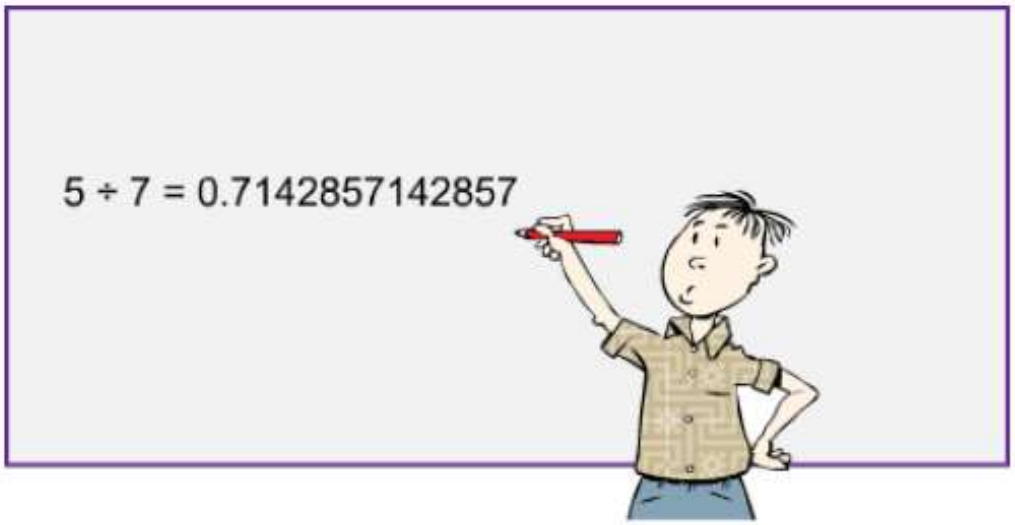
Mary is a girl and is standing 24th in the line.

Her brother Peter is also in the line.

In what position can Peter **not** be standing in?

- 26th
- 27th
- 36th
- 37th

Graeme divides 5 by 7.



He can see that the digits are repeating.

The sixth digit after the decimal point is a 5.

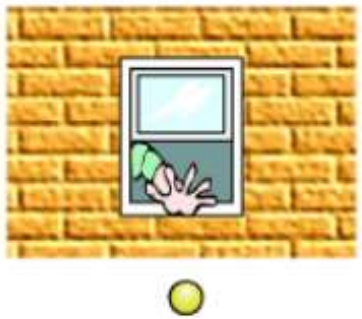
What would be the 23rd digit after the decimal point?

- 1
- 4
- 2
- 8

A ball is dropped from a window and falls 16 metres.

It bounces, rising to half its previous height before falling back to the ground.

If the ball bounces a total of four times, each time rising to half of the height of the previous bounce, how high will the ball rise on the fourth bounce?



- 1 m
- 2 m
- 4 m
- 12 m

The symbol δ represents the operation: multiply by 3 and add 2.

This means $\delta(5) = 3 \times 5 + 2$

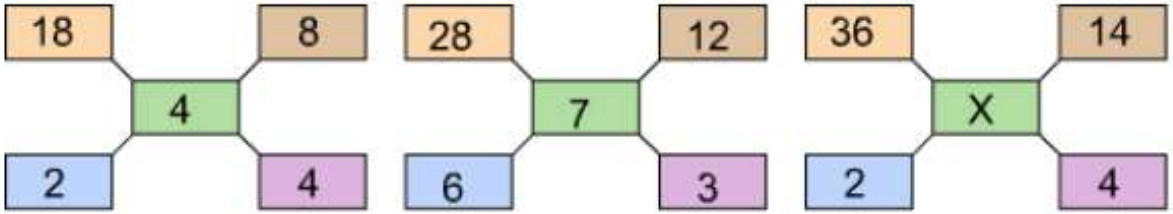
$= 15 + 2$

$= 17$

What will be the answer for $\delta(8)$?

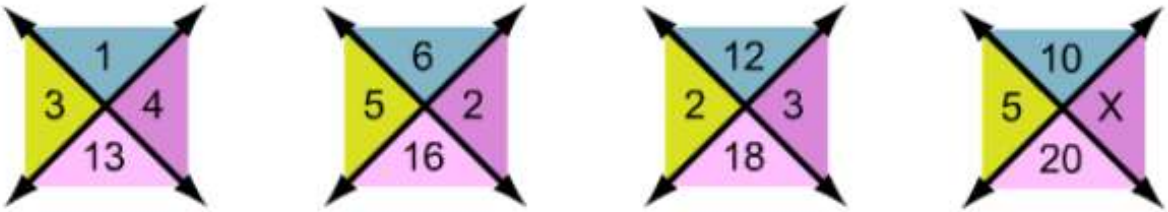
- 19
- 22
- 26
- 30

In each pattern the number in the middle is found using a number sentence formed with the other four numbers.



What is the value of X?

- 8
- 10
- 16
- 20



The four numbers in each of the diagrams have a numerical relationship.

What is the value of X?

- 2
- 3
- 4
- 5

Kahlia wrote out the odd numbers in a pattern of rows and columns.

	a	b	c	d	e	f	g	h	i	j
A	1	3	5	7	9	11	13	15	17	19
B	21	23	25	27	29	31				
C										
D										

The pattern continues down the page.

The number 73 is in

- Row D Column b
- Row D Column g
- Row E Column b
- Row E Column g

Kahlia wrote out the odd numbers in a pattern of rows and columns.

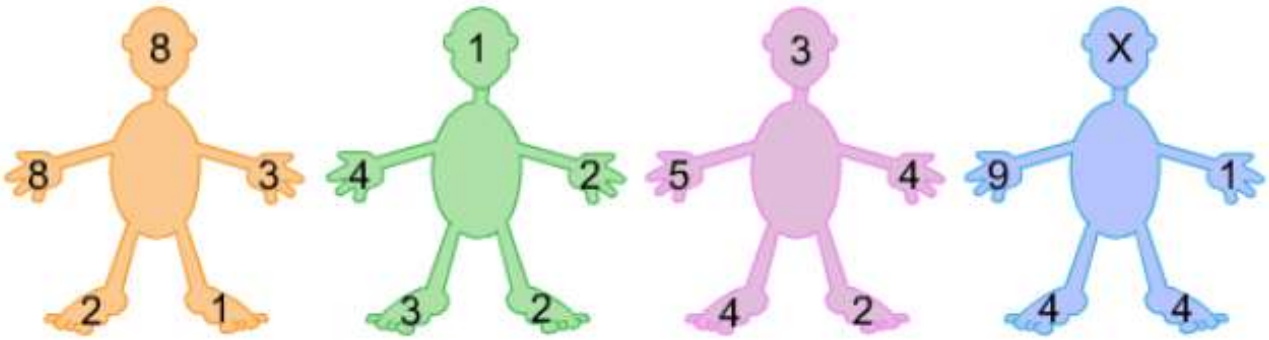
	a	b	c	d	e	f	g	h	i	j
A	1	3	5	7	9	11	13	15	17	19
B	21	23	25	27	29	31				
C										
D										

The pattern continues down the page.

What number will appear in row F, column h?

- 95
- 105
- 115
- none of these

The diagrams in this puzzle look like people.

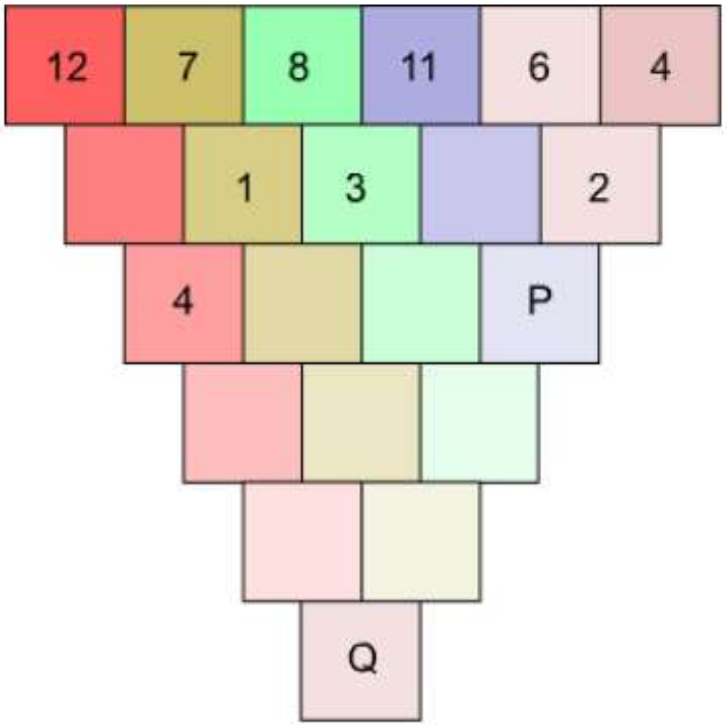


The numbers in the 'heads' of the 'puzzle people' have a numerical relationship with the numbers in the 'hands' and the numbers in the 'feet'.

What is the value of X?

- 1
- 2
- 3
- 4

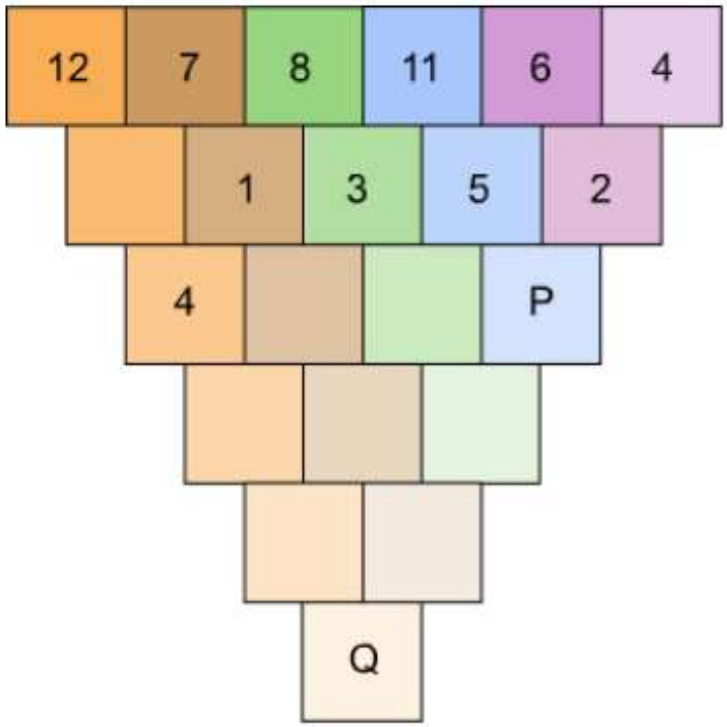
The numbers in the blocks follow a pattern.



P =

- 3
- 4
- 5
- 6

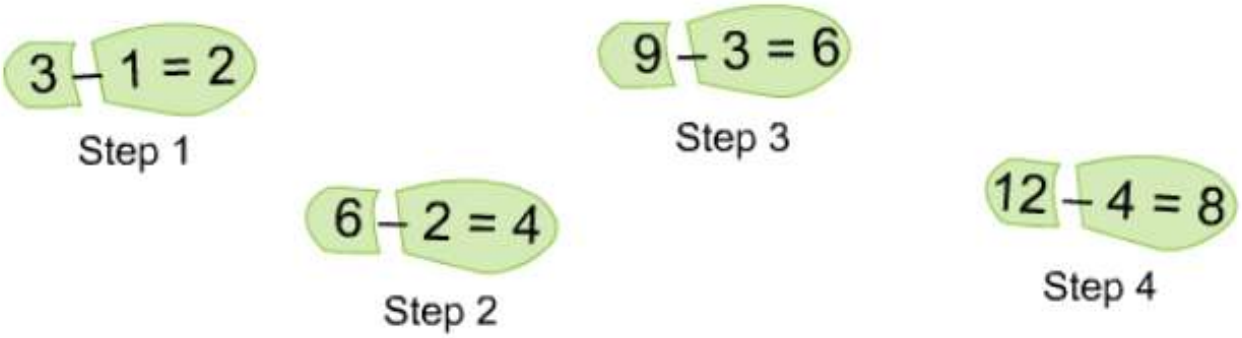
The numbers in the blocks follow a pattern.



Q =

- 3
- 2
- 1
- 0

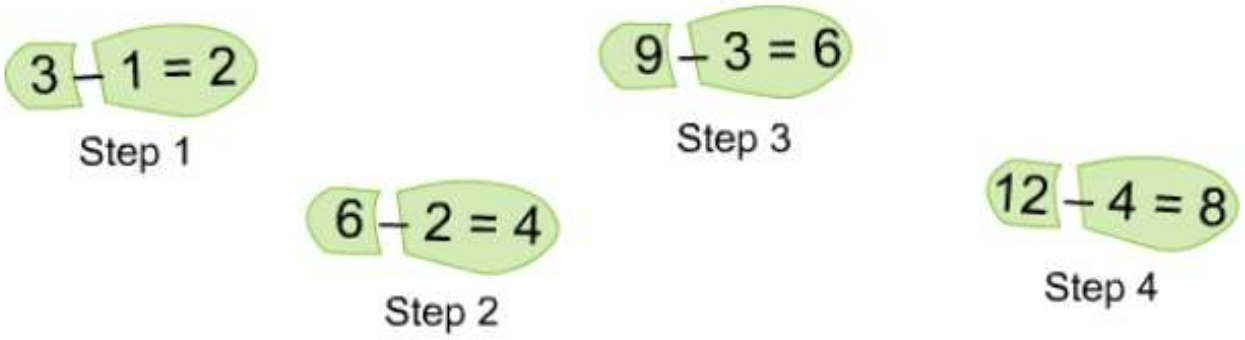
Here are some steps in a pattern:



What is Step 9?

25 – 9 = 16	27 – 9 = 18	29 – 9 = 20	none of these

Here are some steps in a pattern:



Which is **not** a step in the pattern?

21 – 7 = 14

36 – 12 = 24

51 – 17 = 34

65 – 21 = 44

Using matches, Hillary made this pattern of squares.

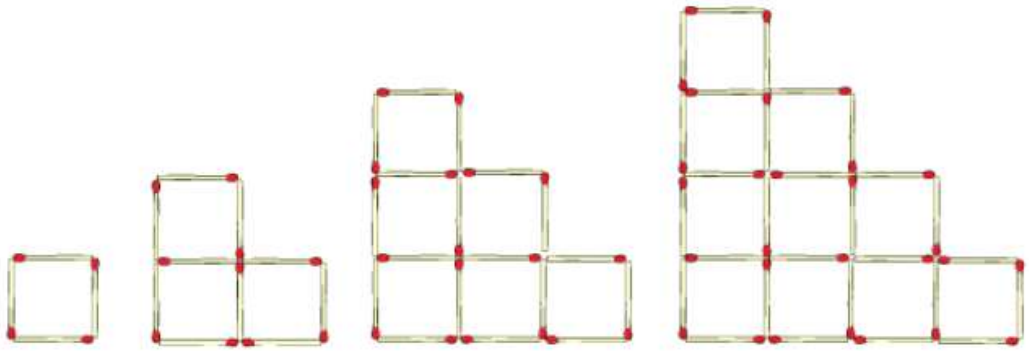


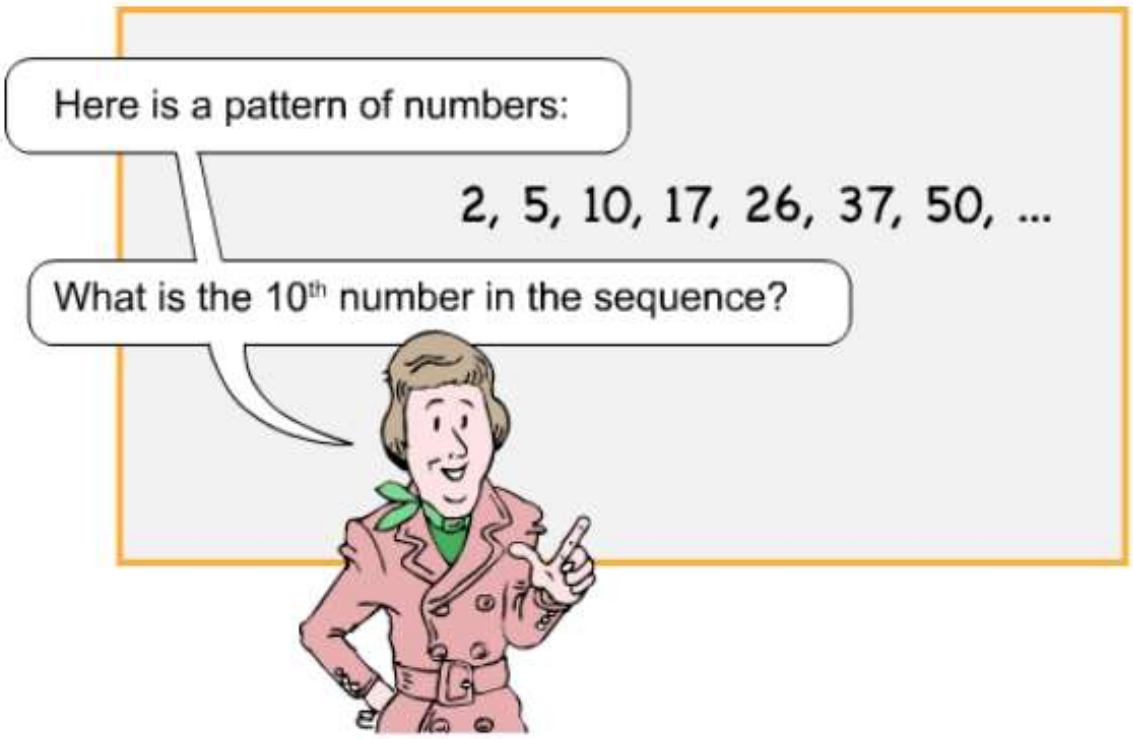
Figure 1 Figure 2 Figure 3 Figure 4

Hillary continued the pattern to make the next diagram and wrote the numbers in a table.

Squares	1	3	6	10	X
Number of matches	4	10	18	28	Y

What numbers can replace the X and Y?

- X = 15, Y = 40
- X = 15, Y = 38
- X = 14, Y = 38
- X = 14, Y = 40


Here is a pattern of numbers:
2, 5, 10, 17, 26, 37, 50, ...
What is the 10th number in the sequence?

- 83
- 87
- 99
- 101