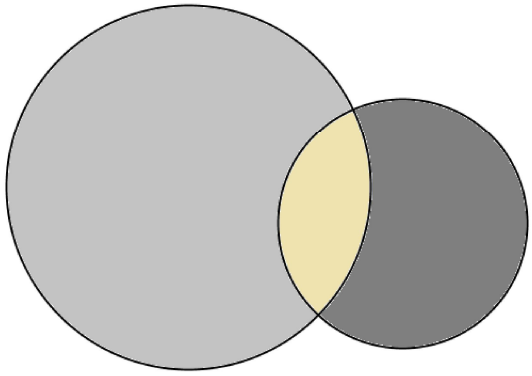


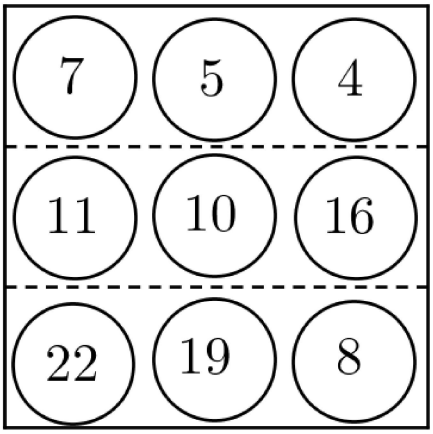
12. During the final game of a soccer championship the teams scored a lot of goals. Six goals were scored during the first period of the game and the guest team was leading at the halftime break. During the second period, the home team scored 3 goals and, as a result, they won the game. How many goals did the home team score altogether?

13. Twenty girls stood in a row, facing right. Four boys joined the row, but facing left. Each boy counted the number of girls in front of him. The numbers were 3, 6, 15 and 18, respectively. Each girl also counted the number of boys in front of her. What was the sum of the numbers counted by the girls?

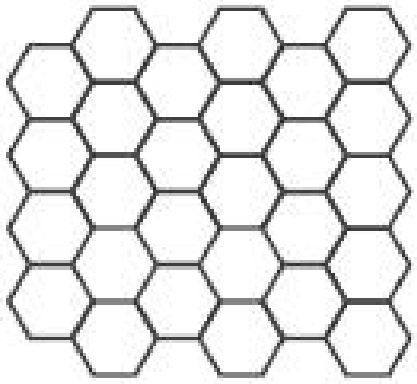
14. Six boys share an apartment with two bathrooms, which they use every morning beginning at 7:00 am. There is never more than one person in either bathroom at any one time. They spend 8, 10, 12, 17, 21

and 22 minutes at a stretch in the bathroom, respectively. What is the earliest time they can finish using the bathrooms?

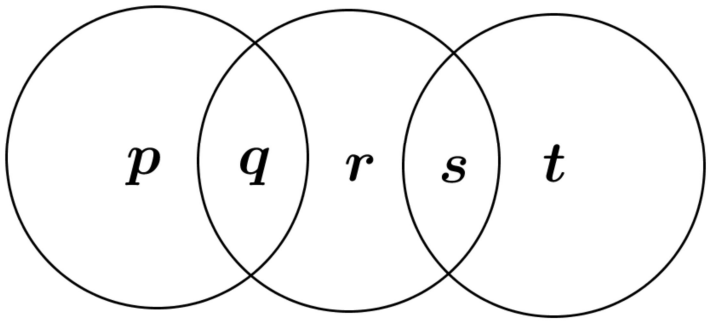
15. A puzzle starts with nine numbers placed in a grid, as shown below. At each move, you are allowed to swap any two numbers. The aim is to arrange the numbers in a way that the sum total of each row is a multiple of 3. What is the smallest number of moves needed?



16. Serena colours the hexagons on the tiling shown below. If two hexagons share a side, she colours them with different coloured pencils. What is the least number of colours that she can use to colour all of the hexagons?



17. In the diagram, p, q, r, s, and t represent five consecutive integers, not necessarily in order. The sum of the two integers in the leftmost circle is 63. The two integers in the rightmost circle add up to 57. What is the value of r?



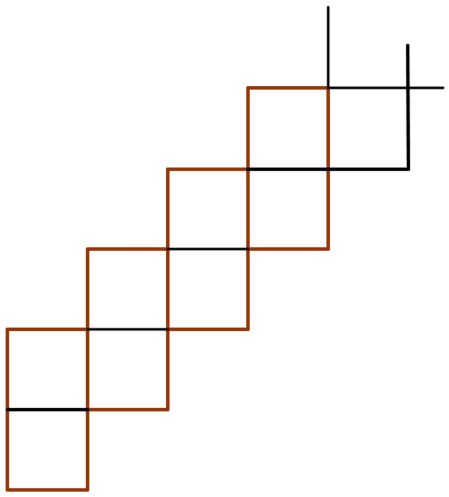
18. In the next line insert "+" signs between the numbers as many times as you want so that the result is a correct equality. $987654321 = 90$. Example: $9 + 8 + 7 + 65 + 4 + 3 + 21 = 117$.

19. Somebody placed the digits $1, 2, 3, \ldots, 9$ around the circumference of a circle in an arbitrary order. By

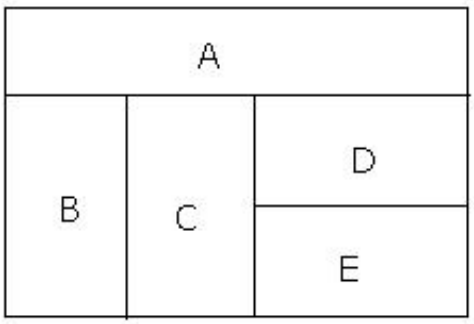
reading three consecutive digits clockwise, you get a 3-digit whole number. There are nine such 3-digit numbers altogether. Find their sum.

20. Given are two three-digit numbers a and b and a four-digit number c. If the sums of the digits of the numbers $a+b$, $b+c$ and $c+a$ are all equal to 3, find the largest possible sum of the number $a+b+c$.

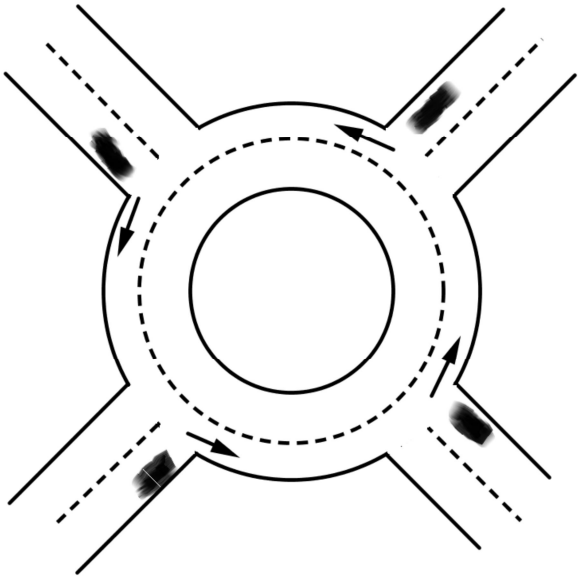
21. A shape consisting of 2016 small squares is made by continuing the pattern shown in the diagram. The small squares have sides of 1 cm each. What is the length, in cm, of the perimeter of the whole shape?



22. In how many ways can each region of the figure be coloured using 4 different colours so that no adjacent ones will have the same colour?

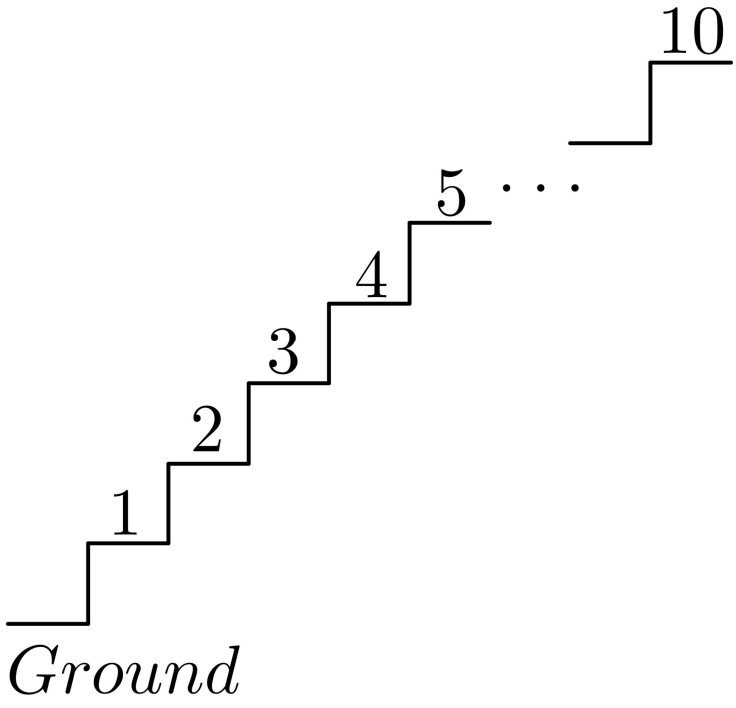


23. Four cars enter a roundabout at the same time, each one from a different direction, as shown in the diagram. Each of the cars drives less than a full round, and no two cars leave the roundabout at the same exit. How many different ways are there for the cars to leave the roundabout?

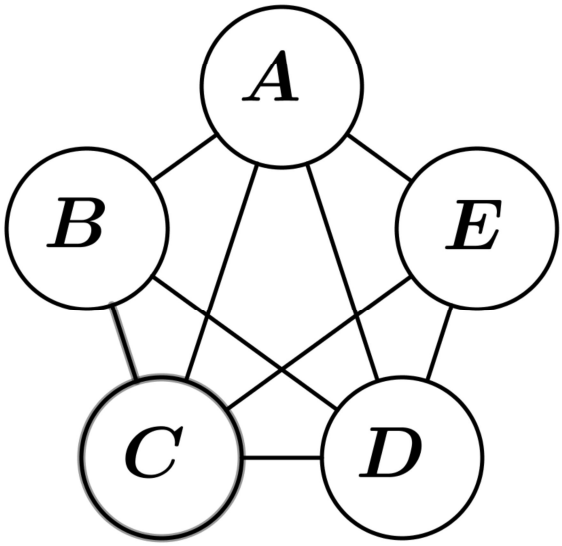


24. A staircase has 10 steps. If Peter can climb either

1 or 2 steps each time, in how many ways can he reach the top?



25. The figure shows five circles A, B, C, D and E. They are to be painted, each in one colour. Two circles joined by a line segment must have different colours. If five colours are available, how many different ways of painting are there?



26. Find the sum of the number pattern below:

1	2	3	...	30
2	3	4	...	31
3	4	5	...	32
...				
30	31	32	...	59.

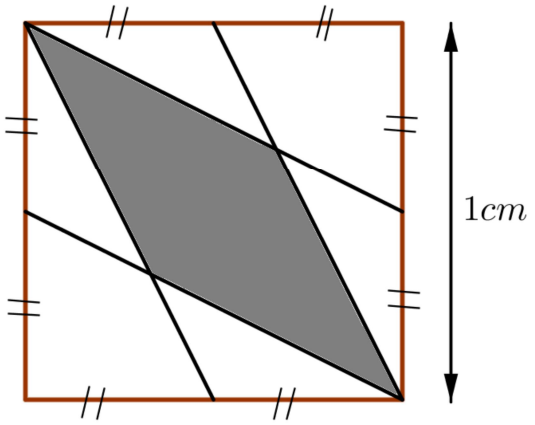
27. Five kids A, B, C, D and E are sitting around a circular table with some candies. Each of them gets an even number of candies. The quantities are $10, 30, 20, 20$ and 40, respectively. In the first round, each of them gives one half of their candies to the kid to their right. At this time, the amounts of their candies become $25, 20, 25, 20$ and 30, respectively. If the kid's number of candies is odd, then he she should pick one from the table. Is it possible that the

kids have the same number of candies after several rounds? How many pieces would everyone have? If it is possible, please write down the process. Explain your reasoning if it is not possible.

28. Integer numbers are filled in a square grid in a pattern shown below. Which column and which row contain number 2000?

1	**2**	**9**	**10**	**25**		
4	**3**	**8**	**11**	**24**		
5	**6**	**7**	**12**	**23**		
16	**15**	**14**	**13**	**22**		
17	**18**	**19**	**20**	**21**		

29. Find the area of the shaded part in below figure:



30. Money in Wonderland comes in \$5 and \$7 bills.

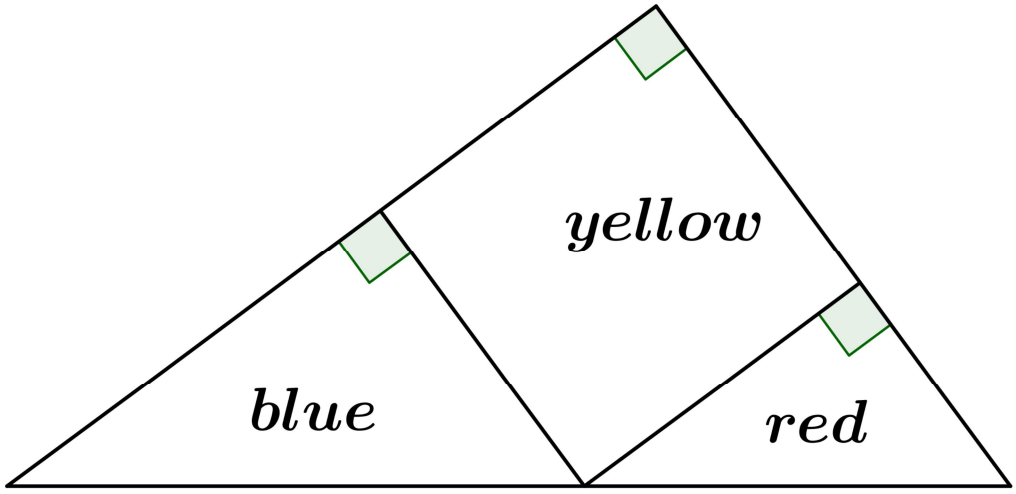
    (a) What is the smallest amount of money you need to have in order to buy a slice of pizza which costs \$1 and get your change in full? (The pizza man has plenty of \$5 and \$7 bills.) For example, having \$7 won't do, since the pizza man can only give you \$7 back.

    (b) Vending machines in Wonderland accept only exact payments (do not give back change). List all positive integer numbers which CANNOT be used as prices in such vending machines. (That is, find the sums of money that cannot be paid by exact change.)

31. The "4" button on my calculator is defective, so I cannot enter numbers which contain the digit 4. Moreover, my calculator does not display the digit 4 if it is part of an answer. Thus, I cannot enter the calculation 2×14 and do not attempt to do so. Also, the result of multiplying 3 by 18 is displayed as 5 instead of 54 and the result of multiplying 2 by 71 is displayed as 12 instead of 142. If I multiply a positive one-digit number by a positive two-digit number on my calculator and it displays 26, list all possible number pairs I could have multiplied?

32. Find the 2016^{th} digit of number A which is formed by following pattern:
$A = 14916253649648110012 1 \ldots$

33. The diagram shows a right-angled triangle formed from three different coloured papers. The red and blue coloured papers are right-angled triangles, with the longest sides measuring 3 cm and 5 cm, respectively. The yellow paper is a square. Find the total area of the red and blue coloured papers.



34. In the following figure, AC is a diameter of a circle. $\triangle ACB$ is an isosceles triangle with $\angle C = 90°$. D is a point on AB. Arc CD is part of a circle with centre B. If $AC = 10$cm, find the area of the shaded part. (Use $\pi = 3$).