An Extraterrestrial Zoo has animals from Mars and from Venus. There are 54 animals from Mars and 6 times less animals from Venus. How many animals are in the Zoo?

Janet enters all the digits from 1 to 9 in the cells of a 3×3 table, so that each cell contains one digit. She has already entered 1, 2, 3 and 4, as shown. Two numbers are considered to be 'neighbours' if their cells share an edge. After entering all the numbers, she notices that the sum of the neighbours of 9 is 15. What is the sum of the neighbours of 8?

1		3
2		4

Problem 3

Ann and Mary are going to travel by train. They decided to meet at the fourth carriage. Ann counts carriages from the head of the train, while Mary counts from the tail of the train. Nevertheless they both got the same railway carriage. How many railway carriages are in the train?

Problem 4

In a survey, 90 people were asked "What is your favorite pet?" Their responses were recorded and then graphed. In the graph, the bar representing "favorite pet is dog" has been omitted. How many people selected a dog as their favorite pet?
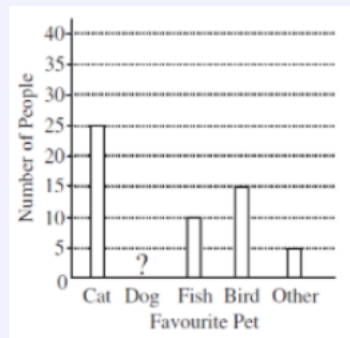
Problem 5

How many positive whole numbers, including 1, divide exactly into both 40 and 72?

Problem 6

After walking 8 km at a speed of 4 km/h, Ann starts to run at a speed of 8 km/h. For how many minutes will she have to run in order to have an average speed of 5 km/h over her complete journey?

Problem 7

Six boys share a flat with two bathrooms which they use every morning beginning at 7 : 00 AM. In each bathroom there is never more than one person at any one time. The times they spend in the bathroom are 8, 10, 12, 17, 21 and 22 minutes. What is the earliest time that they can finish using the bathrooms?

The digits from 1 to 9 are to be written in the nine cells of the 3×3 grid shown, one digit in each cell.

The product of the three digits in the first row is 12.

The product of the three digits in the second row is 112.

The product of the three digits in the first column is 216.

The product of the three digits in the second column is 12.

What is the product of the digits in the shaded cells?

12

112

216 12

Problem 9

Dates can be written in the form DD.MM.YYYY. For example, today's date is 18.03.2022. A date is called 'surprising' if all 8 digits in its written form are different. In what month will the next surprising date occur?

Problem 10

Aaron has to choose a three-digit code for his bike lock. The digits can be chosen from 1 to 9. To help him remember them, Aaron chooses three different digits in increasing order, for example 278. How many such codes can be chosen?

Problem 11

How many weeks are equivalent to 3360 hours?

Problem 12

Paul, Quincy, Rochelle, Surinder, and Tony are sitting around a table. Quincy sits in the chair between Paul and Surinder. Tony is not beside Surinder. Who is sitting on either side of Tony?

Problem 13

How many times does the digit 9 appear in the answer to 987654321×9?

Problem 14

How many different 6-letter sequences are there that consist of one letter A, two letters B, and three letters C?

Problem 15

Two sportsmen (Ben and Filip) and two sportswomen (Eva and Andrea) — a speed skater, a skier, a hockey player and a snowboarder — had dinner at a square table, with one person on each edge of the square. The skier sat at Andrea's left hand. The speed skater sat opposite Ben. Eva and Filip sat next to each other. A woman sat at the hockey player's left hand. Which sport did Eva do?

Problem 16

In the XYZ Republic each month consists of 40 days, numbered 1 to 40. Any day whose number is divisible by 6 is a holiday, and any day whose number is prime is a holiday. How many times in a month does a single working day occur between two holidays?

Peter has a lock with a three-digit code. He knows that all the digits of his code are different and that if he divides the second digit by the third and then squares his answer, he will get the first digit. What is the difference between the largest and smallest possible codes?

Catrina runs 100 m in 10 seconds. Sedra runs 400 m in 44 seconds. Maintaining these constant speeds, they participate in a 1 km race. How far ahead, to the nearest meter, is the winner as she crosses the finish line?

Nicholas is counting the sheep in a flock as they cross a road. The sheep begin to cross the road at 2:00 p.m. and cross at a constant rate of three sheep per minute. After counting 42 sheep, Nicholas falls asleep. He wakes up an hour and a half later, at which point exactly half of the total flock has crossed the road since 2:00 p.m. How many sheep are there in the entire flock?

Problem 20

What is the largest amount of postage in cents that cannot be made using only 3 cent and 5 cent stamps?

The whole numbers from 1 to 1000 are written. How many of these numbers have at least two 7's appearing side-by-side?

Problem 22

Juan and Mary play a two-person game in which the winner gains 2 points and the loser loses 1 point. If Juan won exactly 3 games and Mary had a final score of 5 points, how many games did they play?

Problem 23

Seven points are spaced equally around a circle. How many different chords can be formed by joining any 2 of these points? (A chord is a straight line joining two points on the circumference of a circle)

Problem 24

A game is said to be fair if your chance of winning is equal to your chance of losing. How many of the following games, involving tossing a regular six-sided die, are fair?

- You win if you roll a 2

- You win if you roll an even number

- You win if you roll a number less than 4

- You win if you roll a number divisible by 3

Problem 25

The sum of five consecutive integers is equal to the sum of the next three consecutive integers. What is the largest of these eight integers?

Problem 1

If a machine produces 150 items in one minute, how many would it produce in 10 seconds?

Problem 2

In a class, no two boys were born on the same day of the week and no two girls were born in the same month. Were another child to join the class, this would no longer be true. How many children are there in the class?

Problem 3

From noon till midnight, Clever Cat sleeps under the oak tree and from midnight till noon he is awake telling stories. A poster on the tree above him says "Two hours ago, Clever Cat was doing the same thing as he will be doing in one hour's time". For how many hours a day does the poster tell the truth?

Problem 4

During a rainstorm, 15 litres of water fell per square metre. By how much did the water level in Michael's outdoor pool rise?

Problem 5

Eight unmarked envelopes contain the numbers: 1, 2, 4, 8, 16, 32, 64, 128. Eve chooses a few envelopes randomly. Alie takes the rest. Both sum up their numbers. Eve's sum is 31 more than Alie's. How many envelopes did Eve take?

In the multiplication question, the sum of the digits in the four boxes is

$$
\begin{array}{r}
879 \\
\times\,492 \\
\hline
\square\,758 \\
7\square\,11 \\
35\,\square\,6 \\
\hline
43\,\square\,468 \\
\end{array}
$$

A rectangular field is 80 m long and 60 m wide. If fence posts are placed at the corners and are 10 m apart along the four sides of the field, how many posts are needed to completely fence the field?

Problem 8

The number 315 can be written as the product of two odd integers each greater than 1. In how many ways can this be done?

The figure shown is folded to form a cube. Three faces meet at each corner. If the numbers on the three faces at a corner are multiplied, what is the largest possible product?

	5	
	6	
7	3	2
	8	
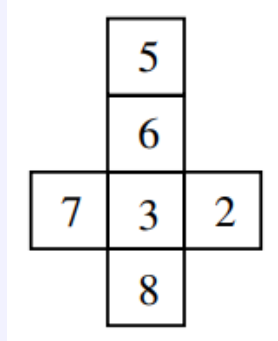
Problem 10

The weight limit for an elevator is 1500 kilograms. The average weight of the people in the elevator is 80 kilograms. If the combined weight of the people is 100 kilograms over the limit, how many people are in the elevator?

Problem 11

Steve plants ten trees every three minutes. If he continues planting at the same rate, how long will it take him to plant 2500 trees?

Emily sits on a chair in a room. Behind her is a clock. In front of her is a mirror. In the mirror, she sees the image of the clock as shown. The actual time is closest to
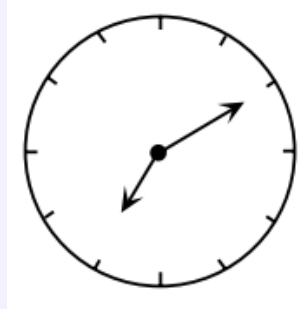
In the 4×4 square shown, each row, column and diagonal should contain each of the numbers 1, 2, 3, and 4. Find the value of $K + N$.

1	F	G	H
T	2	J	K
L	M	3	N
P	Q	1	R

Problem 14

Stephen had a 10:00 a.m. appointment 60 km from his home. He averaged 80 km/h for the trip and arrived 20 minutes late for the appointment. At what time did he leave his home?

Problem 15

André is hiking on the paths shown in the map. He is planning to visit sites A to M in alphabetical order. He can never retrace his steps and he must proceed directly from one site to the next. What is the largest number of labelled points he can visit before going out of alphabetical order?
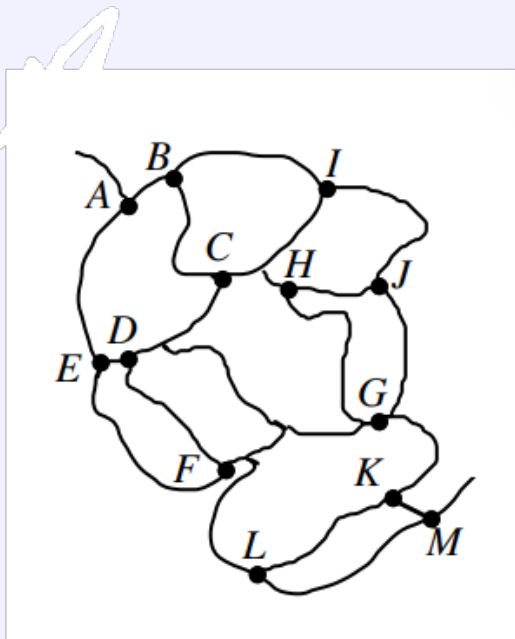
In the addition shown, a digit, either the same or different, can be placed in each of the two boxes. What is the sum of the two missing digits?

```
    8 6 3
  □ 9 1
    7 □ 8
  -------
  2 1 8 2
```

Problem 17

A recipe requires 25 mL of butter to be used along with 125 mL of sugar. If 1000 mL of sugar is used, how much butter would be required?

In the diagram, all rows, columns and diagonals have the sum 12. What is the sum of the four corner numbers?

		4
	4	
	3	

Problem 19

In a certain month, three of the Sundays have dates that are even numbers. What is the tenth day of this month?

Problem 20

Qaddama is 6 years older than Jack. Jack is 3 years younger than Doug. If Qaddama is 19 years old, how old is Doug?

Problem 21

Which of the following can be folded along the lines to form a cube?
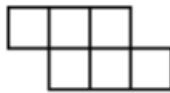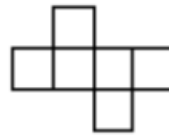
(A) (B) (C) (D) (E)
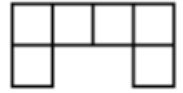
Problem 22

The words "PUNK CD FOR SALE" are painted on a clear window. How many of the letters in the sign look the same from both sides of the window?

Problem 23

A box contains 14 disks, each coloured red, blue or green. There are twice as many red disks as green disks, and half as many blue as green. How many disks are green?

Problem 24

Five years ago today, Sally was 7 years old. In two more years, Sally will be

Problem 25

A two-digit number is divisible by 8, 12 and 18. Find this number.

Problem 1

Kayla went for a walk every day last week. Each day, she walked half as far as she did the day before. If she walked 8 kilometres on Monday last week, how many kilometres did she walk on Friday last week?

Problem 2

A rectangular wooden prism is made up of three pieces, each consisting of four cubes of wood glued together. Which of the pieces below has the same shape as the black piece?

(A) (B) (C) (D) (E)
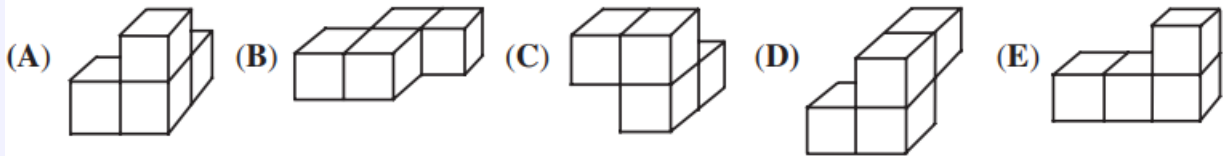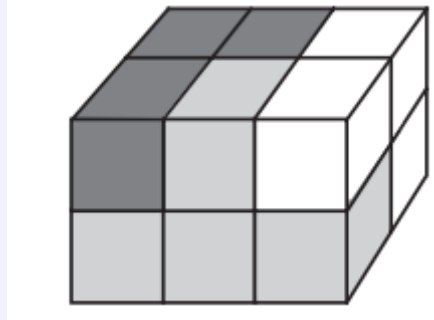
Problem 3

Wesley is 15 and his sister Breenah is 7. The sum of their ages is 22. In how many years will the sum of their ages be double what it is now?

Problem 4

The length of a rectangle is 6 more than twice its width. If the perimeter of the rectangle is 120, what is its width?

Problem 5

Chaz gets on the elevator on the eleventh floor. The elevator goes down two floors, then stops. Then the elevator goes down four more floors and Chaz gets off the elevator. On what floor does Chaz get off the elevator?

In the chart, each number below the top row is the positive difference of the two numbers to the right and left in the row immediately above it. What is the value of x?

```
8     9     17     6     4
   1     8     _     2
      7     _     _
         _     _
            x
```

Using an equal-armed balance, if □□□□ balances ○○ and ○ ○ ○ balances △△, which of the following would not balance ○△□?

(A) ○△□

(B) □□□△

(C) □□ ○ ○

(D) △△□

(E) ○□□□□

Problem 8

Fifteen times a number equals three hundred. The number is

Paul needs to measure the area of a rectangular carpet. However, he does not have a ruler, so he uses a shoe instead. He finds that the shoe fits exactly 15 times along one edge of the carpet and 10 times along another. He later measures the shoe and finds that it is 28 cm long. What is the area of the carpet?

Problem 10

The digits 2, 4, 6 and 8 are each used once to create two 2-digit numbers. What is the largest possible difference between the two 2-digit numbers?
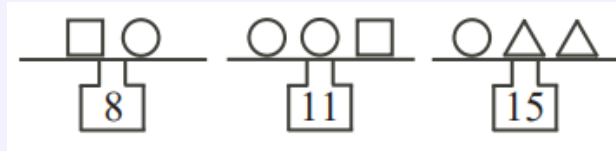
Problem 11

A large box of chocolates and a small box of chocolates together cost £15. If the large box costs £3 more than the small box, what is the price of the small box of chocolates?

Problem 12

If snow falls at a rate of 1 mm every 6 minutes, then how many hours will it take for 1 m of snow to fall?

In the diagram, each scale shows the total mass (weight) of the shapes on that scale. What is the mass (weight) of a $\triangle$?

Problem 14

Ahmed is going to the store. One quarter of the way to the store, he stops to talk with Kee. He then continues for 12 km and reaches the store. How many kilometres does he travel altogether?

Daniel begins with 64 coins in his coin jar. Each time he reaches into the jar, he removes half of the coins that are in the jar. How many times must he reach in and remove coins from his jar so that exactly 1 coin remains in the jar?
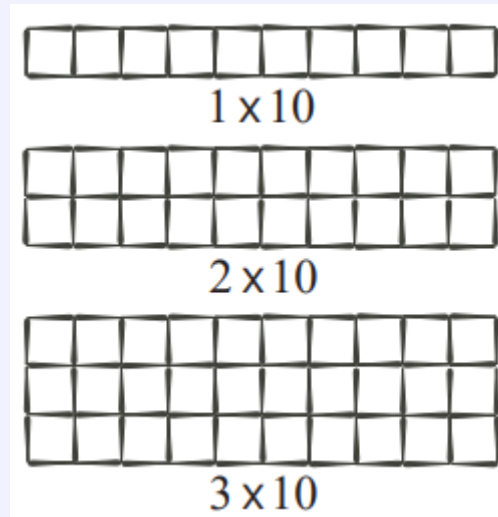
Problem 16

To rent a kayak and a paddle, there is a fixed fee to use the paddle, plus a charge of $5 per hour to use the kayak. For a three hour rental, the total cost is $30. What is the total cost for a six hour rental?

Problem 17

Fred's birthday was on a Monday and was exactly 37 days after Pat's birthday. Julie's birthday was 67 days before Pat's birthday. On what day of the week was Julie's birthday?
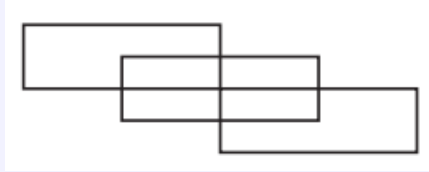
Problem 18

Toothpicks are used to make rectangular grids, as shown. Note that a total of 31 identical toothpicks are used in the 1×10 grid. How many toothpicks are used in a 43×10 grid?

1×10

2×10

3×10

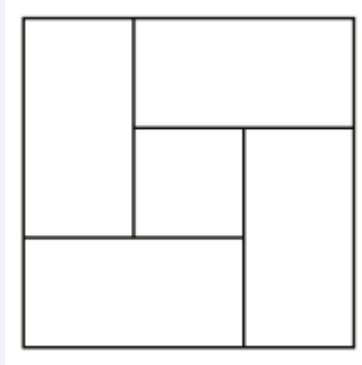## Problem 19

In the diagram shown, the number of rectangles of all sizes is

Each face of a cube is painted with exactly one colour. What is the smallest number of colours needed to paint a cube so that no two faces that share an edge are the same colour?

Problem 21

In the figure shown, the outer square has an area of 9 cm^2, the inner square has an area of 1 cm^2, and the four rectangles are identical. What is the perimeter of one of the four identical rectangles?

Problem 22

How many different 3-digit whole numbers can be formed using the digits 4, 7 and 9, assuming that no digit can be repeated in a number?
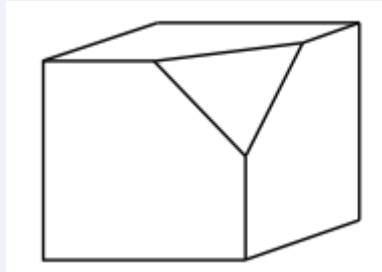
Problem 23

A piece of paper is folded in half, creating two layers of paper. The paper is then folded in half again. This is continued until the paper has been folded in half a total of five times. The total number of layers of paper in the folded sheet is

One corner of a cube is cut off, creating a new triangular face, as shown. How many edges does this new solid have?

Problem 25

Sophia did push-ups every day for 7 days. Each day after the first day, she did 5 more push-ups than the day before. In total she did 175 push-ups. How many push-ups did Sophia do on the last day?