Year 9 and 10 (English Version)

March 2026 Time allowed: 75 minutes

1. For each question exactly one of the 5 options is correct.
2. Each participant is given 30 points at the beginning. For each correct answer 3, 4 or 5 points are added. No answer means 0 points are added. If a wrong answer is given, one quarter of the points is subtracted, i. e. 0.75 points, 1 point or 1.25 points, respectively. At the end, the maximum number of points is 150, the minimum is 0.
3. Calculators and other electronic devices are not allowed.

3 point problems

A1 Which of these expressions has the smallest value?

(**A**) $20 + 26$ (**B**) 202×6 (**C**) $202 - 6$ (**D**) 20×26 (**E**) $202 + 6$

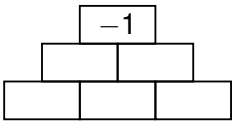
A2 Hannah from our class writes her date of birth in the form DDMMYYYY. DD stands for the two digits of the day, MM for the two digits of the month and YYYY for the four digits of the year. Just like her name, Hannah, her date of birth now reads the same forwards and backwards.
In which month was Hannah born?

(**A**) January (**B**) February (**C**) March (**D**) April (**E**) May

A3 As part of their training, five future nursery school teachers are working in a nursery school with 19 children. To do crafts with the children, they divided all 19 children into 5 small groups of 3 or 4 children each.
How many small groups with 4 children are there?

(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 5

A4 Bennet wants to fill each cell in the figure with the number 1 or -1. The product of two horizontally adjacent numbers must always be equal to the number above them.
In how many different ways can Bennet do this?

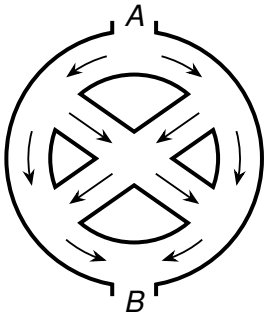


(**A**) 3 (**B**) 4 (**C**) 6 (**D**) 7 (**E**) 9

A5 I discover the following offer at the market: If you buy 3 pairs of socks, you will get the cheapest pair for free. I pick out 6 pairs of socks. They cost €2.80, €3.00, €3.30, €3.40, €3.70 and €3.90.
What is the maximum amount of money I can save using this offer?

(**A**) €6.20 (**B**) €6.30 (**C**) €6.40 (**D**) €6.50 (**E**) €6.60

A6 The picture on the right shows a traffic-calmed area with lots of one-way streets.
How many different ways are there to drive from point *A* to point *B*?



(**A**) 2 (**B**) 4 (**C**) 6 (**D**) 8 (**E**) 10

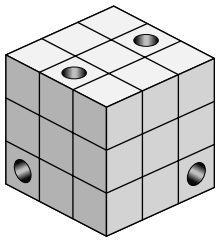
A7 The year 2026 as a number has the following two properties:

(1) Exactly two of its four digits are equal.
(2) The sum of its digits is 10.

For how many years between 2000 and 2100 does the year as a number have these two properties?

(**A**) 2 (**B**) 3 (**C**) 5 (**D**) 6 (**E**) 8

A8 A $3 \times 3 \times 3$ cube is drilled all the way through four times perpendicular to the surface, as shown. How many of the small cubes are drilled through?

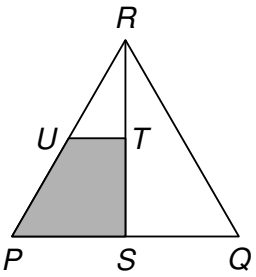


(**A**) 11 (**B**) 10 (**C**) 9 (**D**) 8 (**E**) 7

A9 The 7-digit number 193391*X* is divisible by 6. Which digit is *X*?

(**A**) 0 (**B**) 2 (**C**) 4 (**D**) 6 (**E**) 8

A10 The triangle *PQR* is equilateral. *S* is the midpoint of *PQ*. *T* is the midpoint of *RS*. *U* is the midpoint of *PR*. Therefore *UT* is parallel to *PQ*.
What fraction of the triangle *PQR* is shaded?



(**A**) $\frac{2}{9}$ (**B**) $\frac{2}{5}$ (**C**) $\frac{3}{10}$ (**D**) $\frac{1}{4}$ (**E**) $\frac{3}{8}$

4 point problems

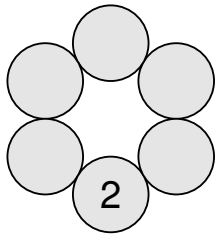
B1 It is holiday season. A grandfather has his grandchildren visiting. The socks belonging to his four grandchildren are fluttering on the washing line. There are more pairs of socks from Marek than from Sonja, more from Sonja than from Kilian, and more from Kilian than from Jorinde. Furthermore, there are half as many pairs of socks from Jorinde as from Marek.
What is the smallest number of pairs of socks that could be hanging on the line?

(**A**) 16 (**B**) 18 (**C**) 20 (**D**) 22 (**E**) 24

B2 $(1-2)-(3-4)-(5-6)-\ldots-(2025-2026) =$

(**A**) -1012 (**B**) -1011 (**C**) 1010 (**D**) 1011 (**E**) 1012

B3 The prime number 2 is written in the diagram on the right. The prime numbers 3, 5, 7, 11 and 13 should be written in the empty circles in such a way that the sum of the two numbers in each pair of adjacent circles is never a prime number.
How many different ways is this possible?

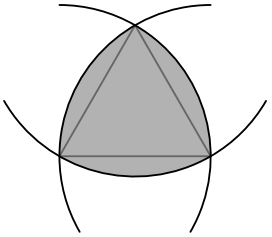


(**A**) 8 (**B**) 9 (**C**) 12 (**D**) 15 (**E**) 16

B4 A group of 30 people booked a boat tour at a fixed price. They want to split the cost equally. Since 3 people cancel at short notice, each remaining passenger now has to pay €2 more than planned.
What is the total cost of the boat tour?

(**A**) €270 (**B**) €300 (**C**) €450 (**D**) €480 (**E**) €540

B5 Around each vertex of an equilateral triangle of side length 2 cm a circle of radius 2 cm is drawn. This creates the shaded shape.
What is the perimeter of the shaded shape?



(**A**) 2π cm (**B**) 6.5 cm (**C**) $\frac{5}{2}\pi$ cm (**D**) 8 cm (**E**) 3π cm

B6 In the strip 

, the numbers 1, 3, 4, 6 and 7 are to be written in the empty boxes. The sum of any two adjacent numbers must not be divisible by 2, and likewise the sum of any three adjacent numbers must not be divisible by 3. What will be the sum of the numbers in the shaded boxes?

(**A**) 5 (**B**) 7 (**C**) 9 (**D**) 11 (**E**) 13

B7 For which digit X does the two digit number XX have exactly X different positive divisors?

(**A**) 4 (**B**) 5 (**C**) 6 (**D**) 7 (**E**) 8

B8 After a hike through the Scottish Highlands, five hikers are covered in midge bites. They have 7, 9, 10, 13 and 14 bites, respectively. Together, Justus and Tuan have three times the number of bites that Ömer has. Together, Dorian and Tuan have twice the number of bites that Felix has. How many bites does Tuan have?

(**A**) 7 (**B**) 9 (**C**) 10 (**D**) 13 (**E**) 14

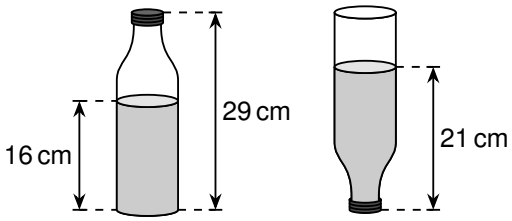
B9 Five girls – Daria, Sofie, Yulia, Stella and Elin – take part in a 100 m swimming race. One of them does not finish and the others finished at different times. When asked about the race some time later, they said:

Daria: "I was third or fourth."
Sofie: "I made it to the finish line, but I wasn't first."
Yulia: "I was first."
Stella: "I didn't make it to the finish line."
Elin: "I was second."

Exactly one of the girls remembered incorrectly, the others remembered correctly. Who was wrong?

(**A**) Daria (**B**) Sofie (**C**) Yulia (**D**) Stella (**E**) Elin

B10 A bottle's capacity is 1.5 ℓ and is filled as shown on the right. The picture shows how the water level changes when the bottle is turned upside down. How much water is in the bottle?



(**A**) 0.8 ℓ (**B**) 0.85 ℓ (**C**) 0.9 ℓ (**D**) 1.0 ℓ (**E**) 1.1 ℓ

5 point problems

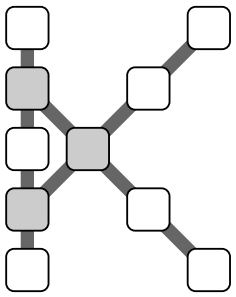
C1 In a competition, each participant plays exactly once against every other participant. Points are awarded as follows: if a game ends in a draw, each player receives 1 point. Otherwise, the winner receives 3 points and the loser receives -1 point. At the end of the competition, the sum of the scores of all the players is 90. How many participants were in the competition?

(**A**) 5 (**B**) 8 (**C**) 10 (**D**) 12 (**E**) 15

C2 Valentina has thought of eight different positive integers, among which there are no three that could be the side lengths of a triangle. What is the minimum value of the largest of these eight numbers?

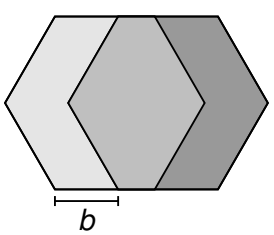
(**A**) 32 (**B**) 33 (**C**) 34 (**D**) 35 (**E**) 36

C3 Jakob wants to write the numbers 1 to 10 in the boxes of the "K"-shaped grid shown. The sum of the numbers on each of the three lines should be the same. Furthermore, this sum should be as large as possible.
What will be the sum of the three numbers in the shaded boxes?



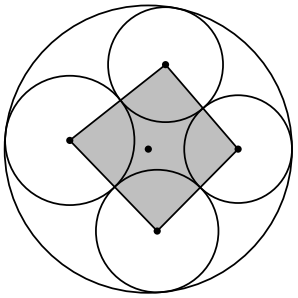
(**A**) 23 (**B**) 24 (**C**) 25 (**D**) 26 (**E**) 27

C4 The figure on the right shows two regular hexagons with a side length of 60 cm. They are offset horizontally by a distance of b cm. The three differently coloured grey areas are the same size (*diagram not to scale*). What is the length marked b?



(**A**) 36 cm (**B**) 39 cm (**C**) 40 cm (**D**) 45 cm (**E**) 52 cm

C5 The large circle in the diagram on the right has a radius of 10 cm. Inside this circle are four smaller circles, each of which touches the large circle on the inside and its two neighbouring circles on the outside. The points marked in the diagram are the centres of the circles. The sum of the distances between the centres of the smaller circles and the centre of the large circle is equal to x cm.
What is the perimeter of the grey quadrilateral?

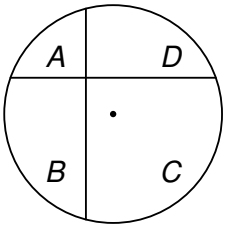


(**A**) $(80 - 2x)$ cm (**B**) $(x + 20)$ cm (**C**) $(40 - x)$ cm
(**D**) $(x + 10)$ cm (**E**) $(2x - 10)$ cm

C6 For the positive real numbers x and y holds $\sqrt{x} + \sqrt{y} = x - y = 11$. What is the value of $x + y$?

(**A**) 37 (**B**) 61 (**C**) 65 (**D**) 83 (**E**) 99

C7 In a circle, two chords that are perpendicular to each other are drawn. One of them is 3 cm away from the centre of the circle, the other is 4 cm away. The two chords divide the circle into four parts A, B, C and D (see figure). The sum of the areas of A and C is X cm^2 greater than the sum of the areas of B and D. What is the value of X?

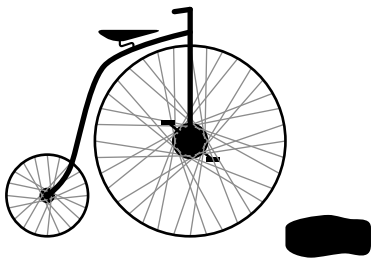


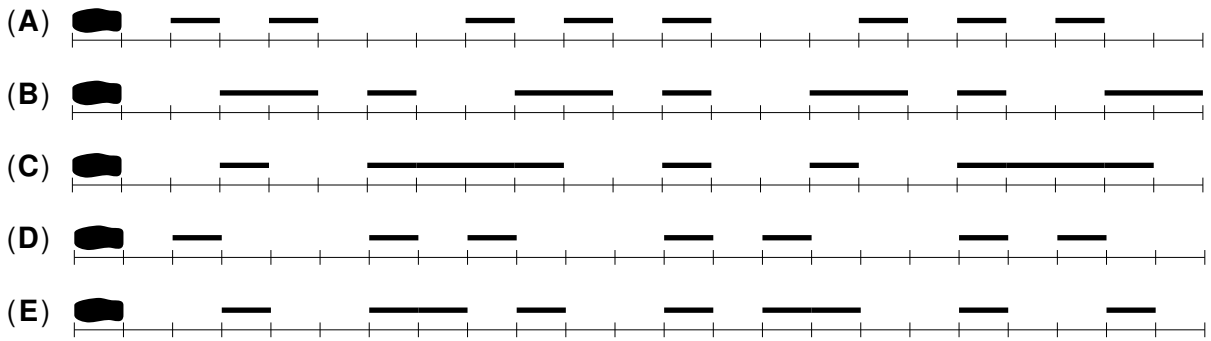
(**A**) 9 (**B**) 16 (**C**) 36 (**D**) 48 (**E**) 60

C8 Kai and Dilek decide to count their building blocks. All the blocks are in a big box. They take turns in removing the blocks from the box: Kai starts and takes 1 building block. Then Dilek takes 2, then Kai takes 3, Dilek takes 4, and so on, always taking one more building block each time. When there are not enough blocks for Kai to follow this pattern, he takes all the remaining blocks. At the end, Kai has 407 building blocks. How many building blocks were in the box at the beginning?

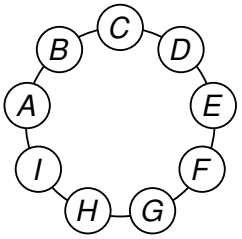
(**A**) 816 (**B**) 827 (**C**) 834 (**D**) 841 (**E**) 851

C9 Emilia rides her high-wheel bicycle through a small puddle, as seen in the picture, and then she continues straight ahead.
What might the track that she leaves behind look like?





C10 The digits $1, 2, \ldots, 9$ are to replace the letters $A, B, \ldots, I$ in the diagram. The 3-digit number ABC must be a factor of the sum of the remaining eight 3-digit numbers, which are read clockwise (BCD, CDE, DEF, $\ldots$, IAB).
How many different possible numbers ABC are there?



(**A**) 2 (**B**) 4 (**C**) 8 (**D**) 16 (**E**) 32