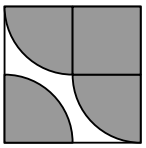
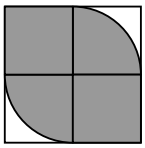
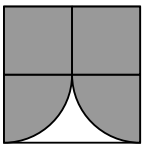
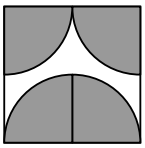
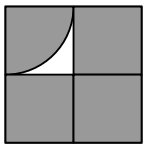
Year 11 to 13 (ENGLISH VERSION)

Thursday, 19th 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 In which of the following squares is the white area the largest?

(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

A2 At the Kangaroo maths camp, a volleyball tournament took place in the afternoon. There were 8 teams, each consisting of 5 or 6 young people. A total of 42 young people took part in the tournament.
How many teams consisted of 6 young people?

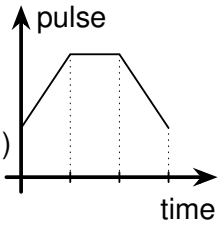
(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 5

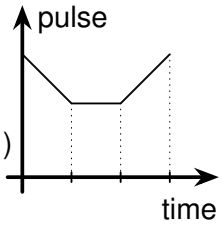
A3 What is the sum of the digits in the result of the division on the right?

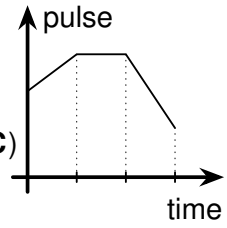
$$\underbrace{33333333333333333333}_{\text{20 threes}} \div 33$$

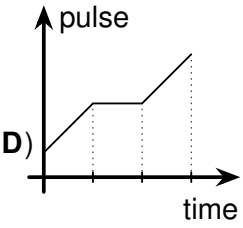
(**A**) 10 (**B**) 15 (**C**) 21 (**D**) 30 (**E**) 60

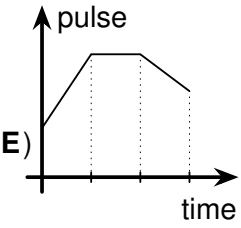
A4 Laura measures her pulse with her smartwatch while jogging. In the first 10 minutes, her pulse increases by 4 bpm (beats per minute) every minute. Her pulse remains steady for the next 10 minutes. After that, her pulse drops by 2 bpm every minute for 10 minutes.
Which of the following diagrams shows Laura's pulse while jogging?

(**A**) 

(**B**) 

(**C**) 

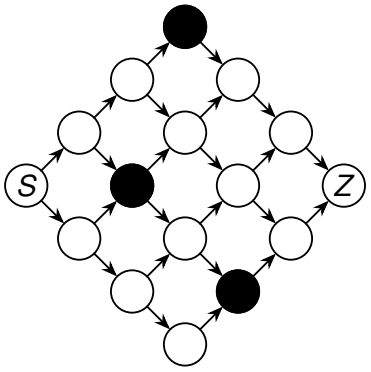
(**D**) 

(**E**) 

A5 A shoe store has the following special offer: If you buy 3 pairs of socks, you will get the cheapest pair at half price. Julia selects 6 pairs of socks.
They cost €2.80, €3.00, €3.30, €3.40, €3.70 and €3.90, respectively.
What is the maximum amount of money Julia can save using this offer?

(**A**) €2.95 (**B**) €3.10 (**C**) €3.15 (**D**) €3.20 (**E**) €3.25

A6 How many ways are there from S to Z, moving only in the direction of the arrows and only through white circles?

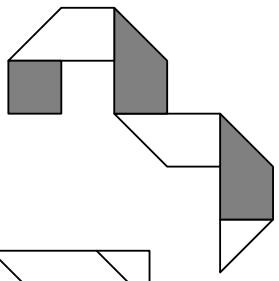


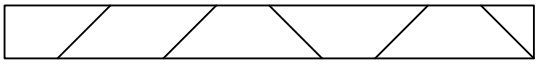
(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 8 (**E**) 9

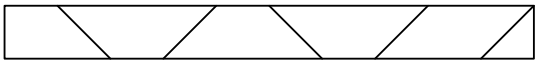
A7 A triangle ABC has integer side lengths (measured in cm). The side AB is 1 cm long, and the side BC is 9 cm long. How long is the side AC?

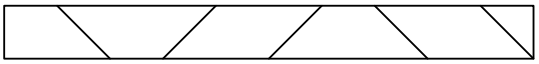
(**A**) 5 cm (**B**) 7 cm (**C**) 9 cm (**D**) 11 cm (**E**) 13 cm

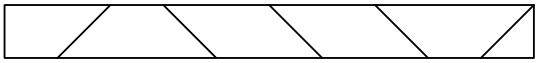
A8 Ahmet folded a strip of paper along 5 diagonal lines (see diagram). Now he unfolds it. What do the fold lines look like on the white side?

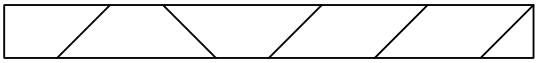


(**A**) 

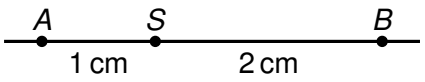
(**B**) 

(**C**) 

(**D**) 

(**E**) 

A9 The point S divides the line segment AB in the ratio 1 : 2. Now, two points on AB are selected randomly and independently of each other. What is the probability that these two points are on different sides of S?



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

A10 In a game, there are 4-guilder coins and 5-guilder coins. What is the largest integer amount that cannot be paid exclusively with these coins?

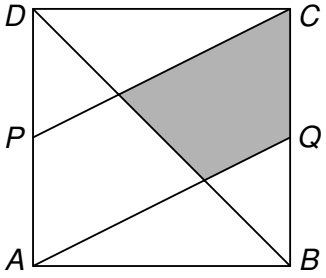
(**A**) 6 guilders (**B**) 11 guilders (**C**) 17 guilders (**D**) 37 guilders (**E**) 43 guilders

4 point problems

B1 Five friends are decorating the large Easter bouquet at school. To do this, they have painted eggs. Lina has painted more eggs than Maren, Maren has painted more than Nino, Nino has painted more than Olessia, and Olessia has painted more than Phil. Furthermore, Phil has painted half as many eggs as Lina. In total, the five friends painted fewer than 35 eggs. How many eggs were there exactly?

(**A**) 30 (**B**) 31 (**C**) 32 (**D**) 33 (**E**) 34

B2 The diagram shows a square $ABCD$ divided by three line segments, where P and Q are the midpoints of two opposite sides.
What fraction of the square is grey?



(**A**) $\frac{2}{7}$ (**B**) $\frac{2}{5}$ (**C**) $\frac{3}{8}$ (**D**) $\frac{1}{4}$ (**E**) $\frac{1}{3}$

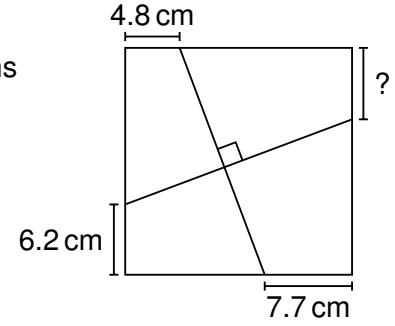
B3 What is the largest possible value that the expression $(\square + \square)^{(\square - \square)}$ can have when you replace the four blanks with the four digits 2, 0, 2 and 6?

(**A**) 2^8 (**B**) 2^9 (**C**) 2^{10} (**D**) 2^{11} (**E**) 2^{12}

B4 The variables a, b and c are to be replaced by three different one-digit natural numbers, such that $a = \left(\frac{b}{c}\right)^2$. How many different ways are there to do this?

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

B5 The diagram shows a square and two lines that are perpendicular. The lengths of three line segments are given.
What is the length of the line segment with the question mark?



(**A**) 5.6 cm (**B**) 5.9 cm (**C**) 6.1 cm (**D**) 6.3 cm (**E**) 6.6 cm

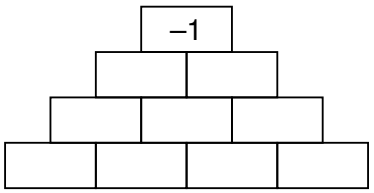
B6 Two standard dice are rolled. What is the probability that the product of the two numbers rolled is divisible by both 4 and 6?

(**A**) $\frac{1}{4}$ (**B**) $\frac{1}{9}$ (**C**) $\frac{2}{9}$ (**D**) $\frac{1}{18}$ (**E**) $\frac{7}{36}$

B7 The natural numbers from 1 to 20 are written on the board. Step by step, Jannis replaces two numbers on the board with a new number according to the following rule: In every third step, he replaces two arbitrary numbers a and b with the number $(a+b+5)$. In all other steps, he replaces two arbitrary numbers a and b with the number $(a+b-3)$. After 19 steps, there is only one number left on the board. Which one?

(**A**) 187 (**B**) 201 (**C**) 213 (**D**) 216 (**E**) 221

B8 Torben writes either a 1 or a –1 in each brick of the number wall shown. The product of two horizontally adjacent numbers should always be equal to the number directly above them.
How many different ways are there to complete the number wall?

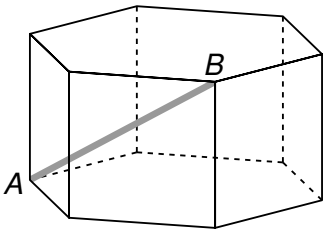


(**A**) 32 (**B**) 24 (**C**) 16 (**D**) 8 (**E**) 6

B9 Among 24 consecutive natural numbers, the sum of the smallest 15 numbers is equal to the sum of the largest 9 numbers. What is the smallest of these 24 numbers?

(**A**) 8 (**B**) 9 (**C**) 11 (**D**) 12 (**E**) 14

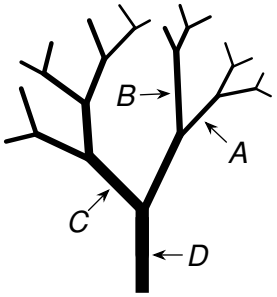
B10 The hexagonal prism shown has two regular hexagons and six squares as faces. All edges are 1 cm long. What is the length of the line segment AB?



(**A**) $\sqrt{2}$ cm (**B**) $\sqrt{3}$ cm (**C**) $\sqrt{4}$ cm (**D**) $\sqrt{5}$ cm (**E**) $\sqrt{6}$ cm

5 point problems

C1 Maite uses a 3D printer to create the tree shown. At all points where the tree branches out, the area of the circular cross-section before the branching is equal to the sum of the areas of the two circular cross-sections after the branching. The diameter of the cross-section at A is 9 mm, the diameter at B is 12 mm and the diameter at C is 20 mm.
What is the diameter of the cross-section at D?

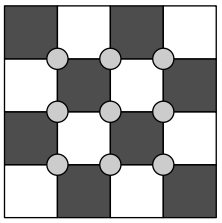


(**A**) 25 mm (**B**) 26 mm (**C**) 28 mm (**D**) 30 mm (**E**) 31 mm

C2 For two non-negative integers a and b, the equation $a^b - ab = 2026$ is true. What is the value of $a+b$?

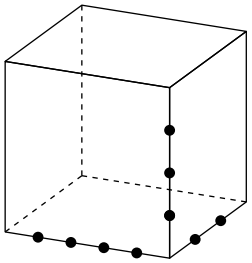
(**A**) 10 (**B**) 11 (**C**) 13 (**D**) 17 (**E**) 25

C3 In the ballroom of the dance school, the dance floor consists of 16 illuminated squares, as can be seen on the right. The 9 grey circles are pressure points that can be used to change the colour of the squares. At the moment, half of the squares are illuminated in white and the other half in blue, giving the dance floor a blue and white chequered appearance. When you step on a pressure point, the 4 adjacent illuminated squares change colour: blue turns white and white turns blue. What is the minimum number of pressure points that must be pressed so that all 16 squares are illuminated in white?



(**A**) 3 (**B**) 4 (**C**) 5 (**D**) 6 (**E**) 7

C4 Nine points are marked on the edges of a cube, as shown.
How many triangular pyramids are there whose 4 corners are all marked points?



(**A**) 36 (**B**) 48 (**C**) 56 (**D**) 60 (**E**) 72

C5 Yesterday, six friends played a new board game at Kiran's round table. Today, the six friends are meeting again. Kiran sits in his usual place, just like yesterday. All the others should sit in such a way that no one sits next to someone who they sat next to yesterday.
In how many ways can the six friends sit at the table like this?

(**A**) 2 (**B**) 4 (**C**) 6 (**D**) 8 (**E**) 12

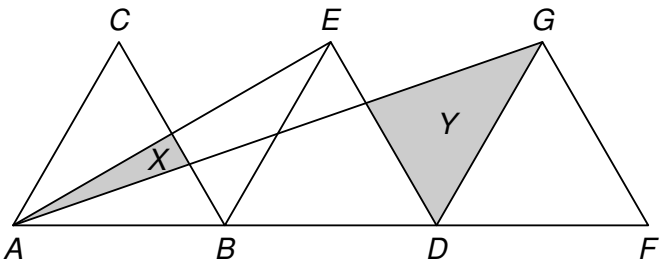
C6 Alexandra threw 100 standard dice and multiplied all the numbers that appeared on the upper faces. The resulting product is 6^{70}. What is the smallest number of times the number 6 could have appeared?

(**A**) 7 (**B**) 10 (**C**) 16 (**D**) 20 (**E**) 24

C7 For a natural number n, let $g(n)$ denote the largest integer less than or equal to $\sqrt{n}$.
What is the value of the alternating sum $g(1) - g(2) + g(3) - g(4) + g(5) - g(6) + \ldots + g(1597) - g(1598)$?

(**A**) –97 (**B**) –58 (**C**) –19 (**D**) –1 (**E**) 21

C8 The triangles ABC, BDE and DFG in the diagram are equilateral and of equal size. Furthermore, the points A, B, D and F lie on a straight line. The areas of the two grey triangles are X and Y.
What is the ratio of X to Y ?



(**A**) 1 : 3 (**B**) 2 : 9 (**C**) 1 : 5
(**D**) 2 : 7 (**E**) 1 : 4

C9 The function f has the property that for every real number x the equations $f(x+10) = f(x)$ and $f(6-x) = -f(x)$ are true. Furthermore, $f(27) = 9$. What is $f(9) + f(13)$?

(**A**) –27 (**B**) –9 (**C**) –3 (**D**) 3 (**E**) 9

C10 The real numbers a and b are given by $3^a = 3375$ and $75^b = 3375$. What is the value of $\frac{1}{a} + \frac{1}{b}$?

(**A**) $\frac{2}{3}$ (**B**) $\frac{3}{4}$ (**C**) $\frac{5}{8}$ (**D**) $\frac{7}{11}$ (**E**) $\frac{9}{14}$