Year 7 and 8 (English Version)

Saturday, March 22nd 2025 Time allowed: 75 minutes

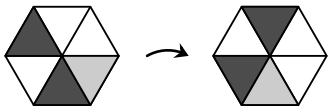
1. For each question exactly one of the 5 options is correct.
2. Each participant is given 30 points at the beginning. For each correct answer 3, 4 or 5 points are added. No answer means 0 points are added. If a wrong answer is given, one quarter of the points is subtracted, i. e. 0.75 points, 1 point 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 On my refrigerator there are four magnets with digits on them **2 0 2 5**.
What is the biggest number that can be made using the magnets?

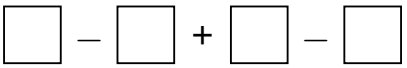
(**A**) 2052 (**B**) 5202 (**C**) 2502 (**D**) 5220 (**E**) 5022

A2 Sami has a hexagonal piece of paper. He rotates it, as shown in the diagram. For each step, he makes the same turn clockwise.
Look at the number of steps below. After which number of steps does the paper look the same as it did at the start?



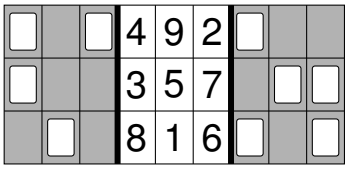
(**A**) 14 steps (**B**) 17 steps (**C**) 10 steps (**D**) 15 steps (**E**) 12 steps

A3 Vivienne uses the numbers 1, 2, 3 and 4. She writes one number in each box to make a calculation. Which is the smallest result Vivienne can get?



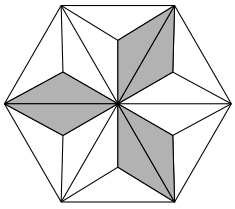
(**A**) -3 (**B**) -4 (**C**) -5 (**D**) -6 (**E**) -7

A4 A piece of card with holes is folded along the thick black lines.
After folding, only one number can still be seen. Which one?



(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 6

A5 The regular hexagon on the right is divided into equally sized triangles.
What fraction of the hexagon is grey?

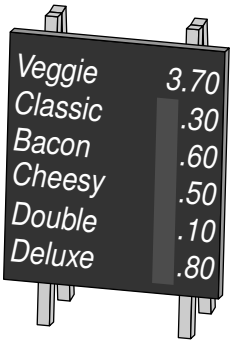


(**A**) $\frac{1}{2}$ (**B**) $\frac{1}{3}$ (**C**) $\frac{1}{4}$ (**D**) $\frac{1}{5}$ (**E**) $\frac{1}{6}$

A6 Louisa was born on the 56th birthday of her grandfather. Today they celebrate their birthday together. Together they are 100 years old. How old is Louisa?

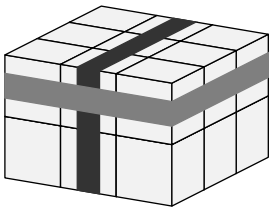
(**A**) 31 (**B**) 29 (**C**) 25 (**D**) 24 (**E**) 22

A7 In front of my favorite burger restaurant stands a board with the menu. The rain washed some of the numbers away. The burgers get more expensive from top to bottom. What is the least amount that a Deluxe burger could cost?



(**A**) 5.80 (**B**) 6.80 (**C**) 7.80 (**D**) 8.80 (**E**) 9.80

A8 A cuboid is made from 18 cubes as shown. Two ribbons are tied around the cuboid. How many cubes touch at least one of the ribbons?



(**A**) 15 (**B**) 13 (**C**) 12 (**D**) 11 (**E**) 9

A9 The new chocolate egg packaging machine packs 100 eggs into foil in 12 minutes. How many chocolate eggs does the machine pack in 12 hours?

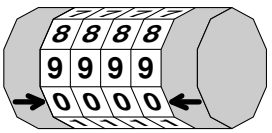
(**A**) 6000 (**B**) 4500 (**C**) 3000 (**D**) 2400 (**E**) 1600

A10 Sandra rolls three dice. Together the dice show 8 dots. Each dice shows a different number. Which number did Sandra definitely not roll?

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

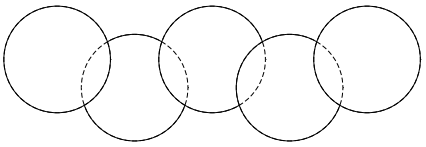
4 point problems

B1 The code of my bike is set at the arrows. At the moment it says 0000. Two rows above it says 8888. Now I set it to the correct combination at the arrows. Two rows above it now says 2719. What is the correct combination?



(**A**) 4931 (**B**) 4593 (**C**) 0531 (**D**) 4537 (**E**) 0937

B2 The shape on the right is made from five circles. Each circle has an area of 8 cm^2. The area of each overlapping part of the circles is 1 cm^2. What is the area of the whole shape?

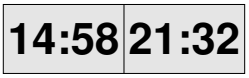


(**A**) 31 cm^2 (**B**) 34 cm^2 (**C**) 36 cm^2 (**D**) 38 cm^2 (**E**) 39 cm^2

B3 At an indoor competition, there is a 60 metres hurdle race. The 5 hurdles are already positioned. The first hurdle is placed 12 metres after the start. The distance between two neighbouring hurdles is 8 metres. How far from the finish line is the last hurdle?

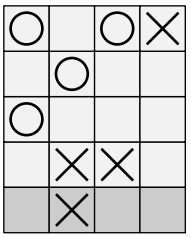
(**A**) 18 metres (**B**) 16 metres (**C**) 14 metres (**D**) 12 metres (**E**) 10 metres

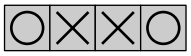
B4 Jad is training on a treadmill in the gym. During training, he looks at two stopwatches. The first stopwatch shows the time which has passed since the start of his training. The second shows the time remaining until the end of his training. Jad looks at the stopwatches later on and is pleased to see both watches show the same time. Which time do they show?

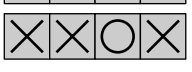
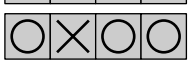


(**A**) 17:45 (**B**) 17:50 (**C**) 18:00 (**D**) 18:15 (**E**) 18:20

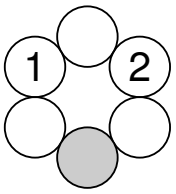
B5 A circle or a cross is to be written in each box in the rectangle shown. In any row or column, there must not be 3 consecutive circles or 3 consecutive crosses. How should the lowest row be filled?



(**A**)  (**B**)  (**C**) 

(**D**)  (**E**) 

B6 A number is written in each of the circles on the right. Each number is the sum of the two numbers in the neighbouring circles. Two numbers are given.
Which number should be written in the grey circle?

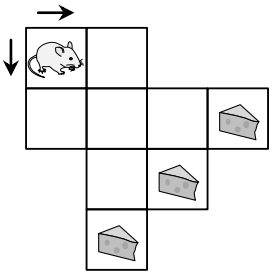


(**A**) 0 (**B**) -1 (**C**) -2 (**D**) -3 (**E**) -5

B7 In a castle there are only noble knights, who always tell the truth, and robber barons, who always lie. There are 8 more noble knights than robber barons.
Each person at the castle was asked: "Are you a noble knight?" Everyone answered, and 20 times the answer was "Yes". How many robber barons are in the castle?

(**A**) 6 (**B**) 7 (**C**) 8 (**D**) 9 (**E**) 10

B8 Willow the mouse wants a piece of cheese. Willow can move from one box to the next box by going to the right or downwards.
How many different routes can Willow take to get to a piece of cheese?

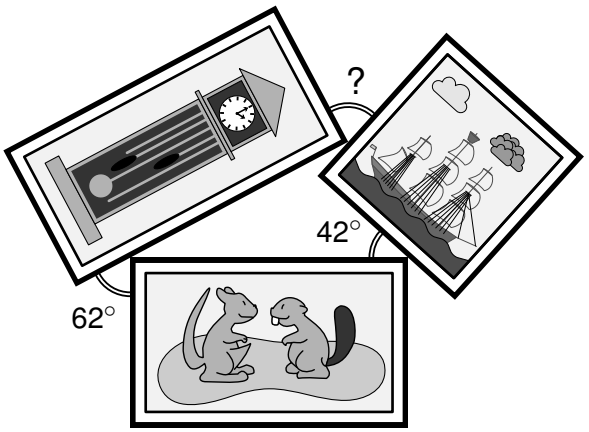


(**A**) 10 (**B**) 8 (**C**) 7 (**D**) 6 (**E**) 5

B9 Mohamad always sets off to school at 8 o'clock. The school is 1 km away. When he walks, his speed is 4 km/h and he arrives at school 5 minutes early. When he cycles, his speed is 15 km/h.
How many minutes early is Diego when he cycles?

(**A**) 12 (**B**) 13 (**C**) 14 (**D**) 15 (**E**) 16

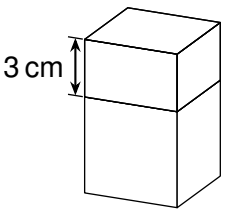
B10 Three rectangular photos lay on the table as shown.
What size is the angle marked with a question mark?



(**A**) 68° (**B**) 70° (**C**) 72° (**D**) 74° (**E**) 78°

5 point problems

C1 The top part of this cuboid is removed to leave a cube. The height of the cube is 3 cm less than the original cuboid. The surface area of the cube is 60 cm^2 less than the cuboid. What is the volume of the original cuboid?

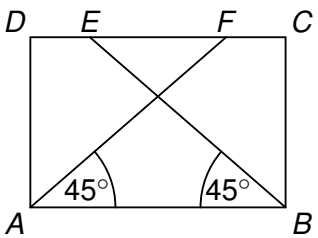


(**A**) 75 cm^3 (**B**) 125 cm^3 (**C**) 150 cm^3 (**D**) 200 cm^3 (**E**) 225 cm^3

C2 The letters A, P and Y stand for three different single-digit numbers. It is known that $Y = P + P = A + A + A$.
What is the value of $P \times A \times P \times A \times Y \times A$?

(**A**) 432 (**B**) 518 (**C**) 576 (**D**) 648 (**E**) 692

C3 In the rectangle $ABCD$ the points E and F lie on the side CD. The angles BAF and EBA are both 45° and $AB + EF = 20$ cm. (*diagram not to scale*)
What is the length of the side BC?



(**A**) 8 cm (**B**) 9 cm (**C**) 10 cm (**D**) 11 cm (**E**) 12 cm

C4 Before a volleyball game, all the players have trained for different lengths of time. In the first group, there are seven girls who trained for 1, 2, 6, 8, 10, 11 and 12 hours. In the second group, there are five girls who trained for 3, 4, 5, 7 and 9 hours. To form two teams with six players, Mila switches from the first to the second group. The coach notices that the average training time increases in both groups.
How long did Mila train for?

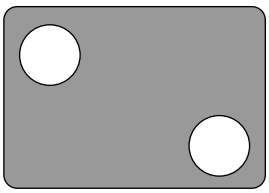
(**A**) 2 hours (**B**) 6 hours (**C**) 8 hours (**D**) 10 hours (**E**) 11 hours

C5 The 8 smallest prime numbers are written in the 8 boxes, so that A is a whole number.
What is the maximum value of A?

$$A = \frac{\square + \square + \square + \square + \square + \square + \square}{\square}$$

(**A**) 20 (**B**) 14 (**C**) 10 (**D**) 8 (**E**) 6

C6 During soccer training, Oskar shot 17 times at a goal wall. He always aims for one of the two holes. Of the shots at the hole at the top left, 60 % are hits. Of the shots at the bottom right hole, 75 % are hits.
How many shots at the bottom right hole were hits?

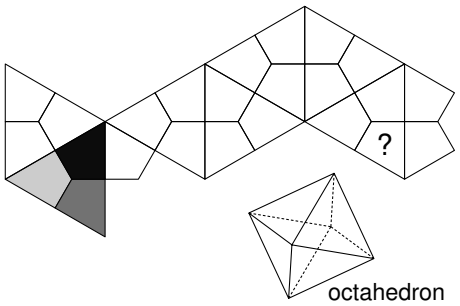


(**A**) 6 (**B**) 7 (**C**) 8 (**D**) 9 (**E**) 10

C7 Five consecutive whole numbers are written on the chalkboard. I wipe two numbers with the sum 72 away. Then I wipe two numbers with the sum 69 away. Which number is still written on the board?

(**A**) 33 (**B**) 34 (**C**) 36 (**D**) 37 (**E**) 39

C8 Jessika folds an octahedron from the net shown. She colours each region of the net either black, dark grey or light grey. When the net is folded, all regions meeting at one vertex and all regions meeting at the opposite vertex have the same colour.
How should Jessika colour the region with the question mark?

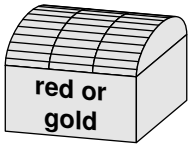


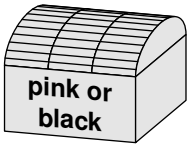
(**A**) definitely black (**B**) black or dark grey
(**C**) definitely dark grey (**D**) dark grey or light grey
(**E**) definitely light grey

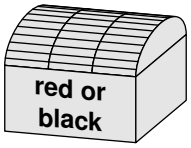
C9 In the holidays, Karim went to mathematics camp with Aya, Lina and Ali from his school. All participants stayed in a four-story house. There were 25 children on floors higher than Aya, and 10 children on floors higher than Lina. There were 5 children below Ali and 2 children below Karim. The number of children accommodated above Karim is a multiple of the number accommodated beneath him.
How many children were at the camp in total?

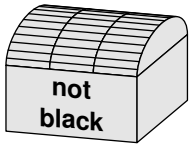
(**A**) 27 (**B**) 30 (**C**) 32 (**D**) 37 (**E**) 40

C10 Rachel has five labelled chests that contain red, gold, pink, black and blue beads. Each chest contains beads of one colour only. Fatima wants to know where the red beads are. Rachel only lets her look into one chest. In which chest should Fatima look so that she will know for sure where the red beads are?

(**A**) 

(**B**) 

(**C**) 

(**D**) 

(**E**)