2024

KENGURUKONKURRANSEN

Problems in English

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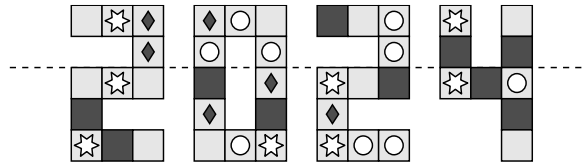
Benjamin

(6.–8. trinn)

20 år
Kengurukonkurransen

3 points

1. Alina folds the image below along the dashed line.

Which of the following squares folds onto an identical one?

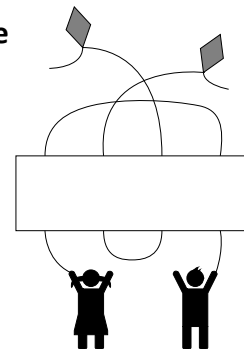(A) ☆ (B) ◆ (C) ▢ (D) ○ (E) ■

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2. The picture shows the first few squares of a hopping game.
Every fourth square in the game has the same image in it.
Mia is playing the game.

In which of the following squares will Mia land only on her right foot?

(A) the 10th   (B) the 15th   (C) the 20th   (D) the 22th   (E) the 23th

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3. **Which of the strips should be placed in the space in the picture so that each child is connected to a different kite?**
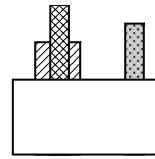

(A)   (B)   (C)   (D)   (E)

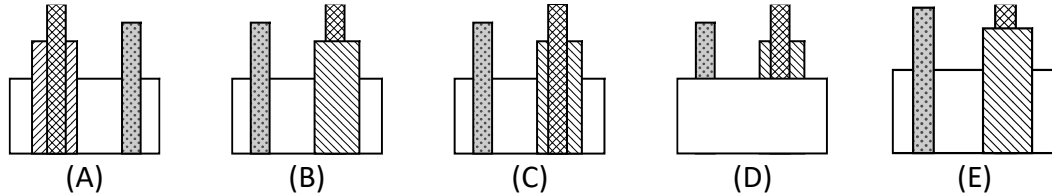MATEMATIKKSENTERET
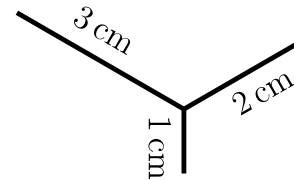Nasjonalt senter for matematikk i opplæringen

4. Dina has set up her three bricks on the floor behind a wall. When seen from the front, the bricks look like this.

How do the bricks look from the back?

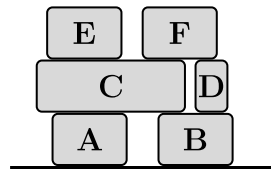|				
(A)	(B)	(C)	(D)	(E)

5. Mona wants to draw the figure shown without lifting up her pencil from the paper. The lengths of the three segments are given.

**What is the shortest total length she could draw?**

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

3 cm   *2 cm*   *1 cm*

**6.** There are six boxes on a truck as shown.

A worker puts them on the floor. He takes one box at a time, provided that box does not have another box on top of it. He places his box on the ground or on top of another box.
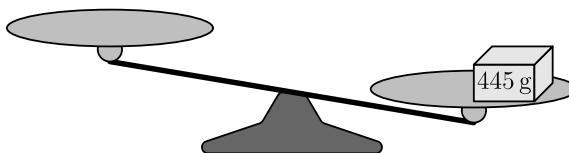
Which of the following stacks could he not build?

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

2

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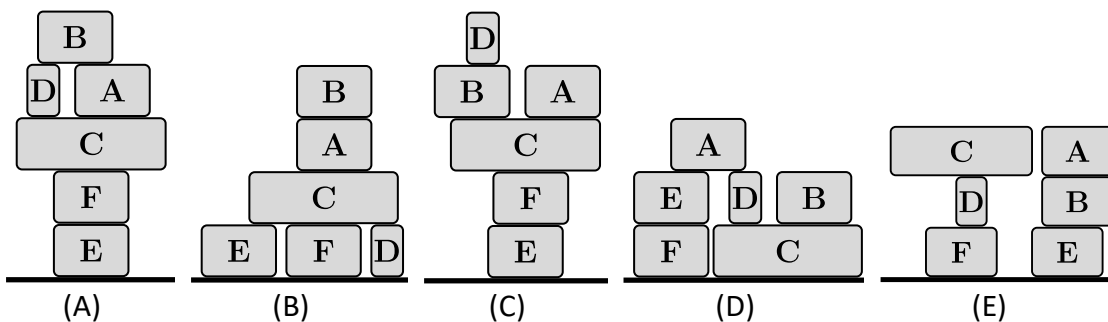
7. Pieter has a package of 445 g and the following eight weights:
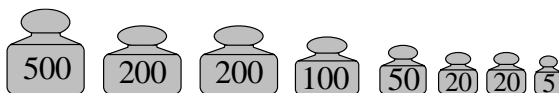
He put the package on the scale, as shown.

What is the minimum number of weights he needs to balance the scale?

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

8. The rooms in the hotel are numbered in ascending order, starting from 1. No number is omitted. Kangaroo counted the digits in the rooms and found digit 2 14 times and digit 5 3 times.

What is the largest number of rooms there can be in the hotel?

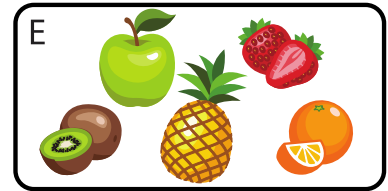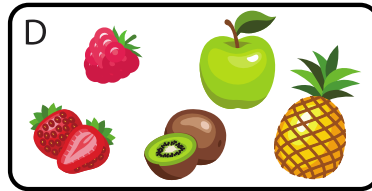(A) 25   (B) 26   (C) 34   (D) 35   (E) 41
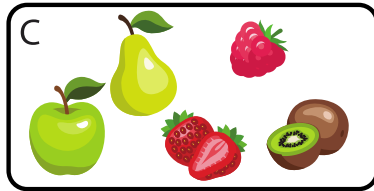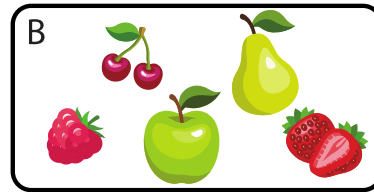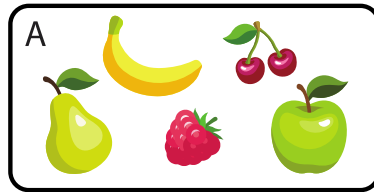
4 points

9. Two identical rectangles, each with area of 18, are overlapping and form a new rectangle with the size of three identical squares.
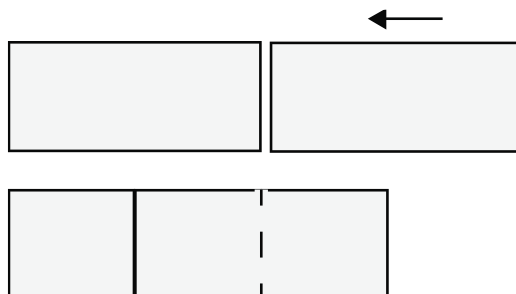
What is the area of the new rectangle?

(A) 20   (B) 27   (C) 30   (D) 32   (E) 36

10. Five boxes are marked with A, B, C, D or E. Each box contains five fruits.

A monkey ate almost all the fruits, and now there is only one fruit left in each box.
See the pictures below.

What letter is on the box where an apple is left?

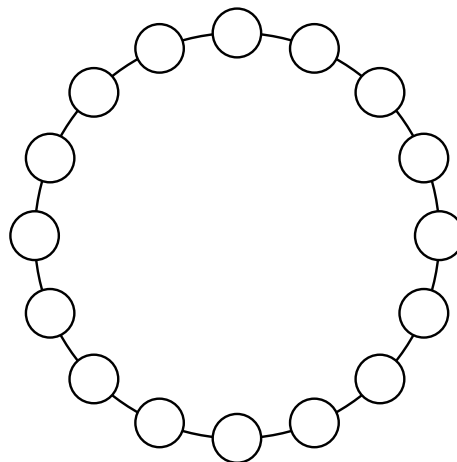(A) A   (B) B   (C) C   (D) D   (E) E

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11. Each of the 16 circles shown contains a number.
Numbers in neighbouring circles differ by 1.
One of the circles contains the number 5 and another one contains 13.

**How many different numbers are written in the 16 circles?**

(A) 9   (B) 10   (C) 13   (D) 14   (E) 16

12. The diagram shows two large squares with the same area. Part of each square is shaded, as shown. In the first square, the midpoints of adjacent sides are joined. In the second square, four smaller squares all with side-lengths equal to a third of the side-length of the large square are shaded. The area shaded in the first square is 9.
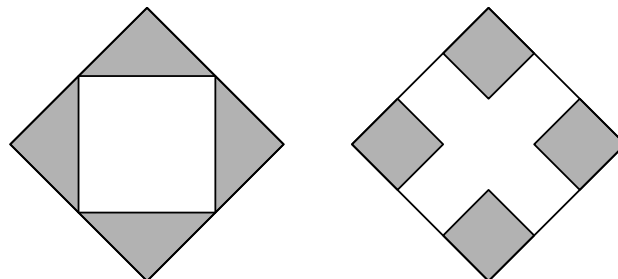
What is the area shaded in the second square?

(A) 4   (B) 8   (C) 9   (D) 10   (E) 12

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13. The figure below shows a beehive with 16 cells. Some of the cells contain honey. The number in each cell indicates how many of its neighbouring cells contain honey. Two cells are neighbours if they share a common edge.
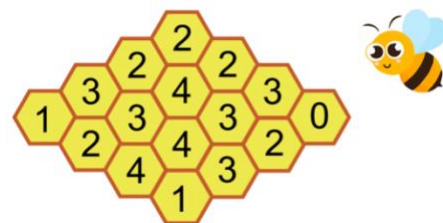
How many cells in the beehive contain honey?

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

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14. Annie wants to place the numbers 1 to 10 in the circles in the diagram with one number in each circle. She wants the sum of the numbers in any four circles that are in a straight line, to be 23.
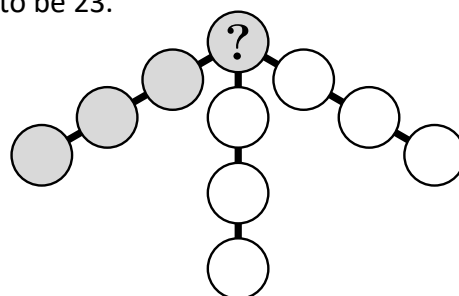
What number must she place in the circle containing the question mark?

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

15. Christian has cut four small squares from the corners of the larger square, so that the remaining area is half of the area of the original square. The side-lenghts of the small squares are shown in the diagram.
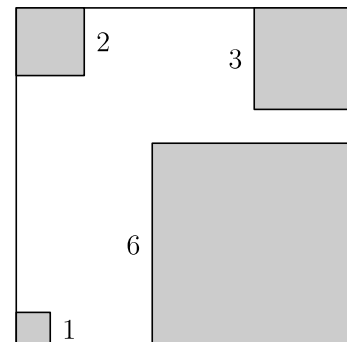
What is the perimeter of the remaining shape?

(A) 36 (B) 40 (C) 44 (D) 48 E) 52

16. The circles in each row and each column must contain the numbers 1, 2, 3 and 4.
The greater than and less than symbols (> and <) will help you on your way.
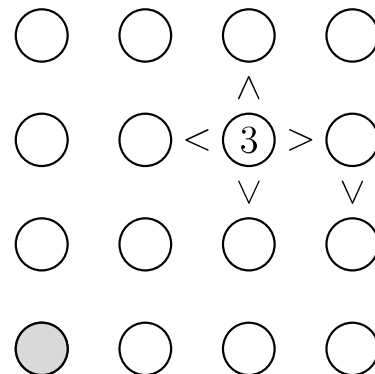
Which number should be in the gray circle?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 2 or 3

5 points

17. The figure shows the plan of the seven train routes of a small town. The circles indicate the stations. Martin wants to paint the lines in such a way that if two lines share a common station, then they are painted with different colours.
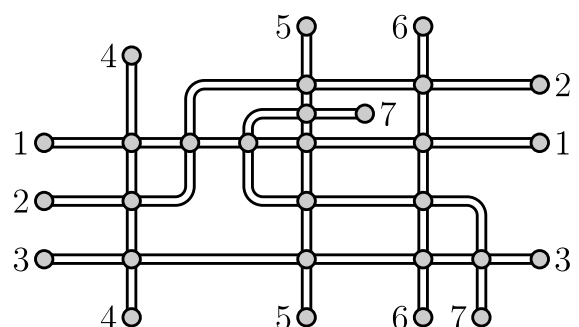
What is the smallest number of colours that he can use?

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

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18. There are three identical special dice on the table.

What is the sum of the numbers on the faces that touch the table?
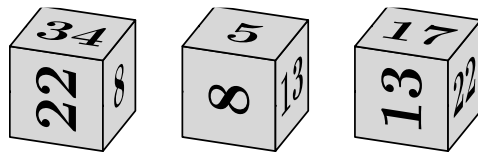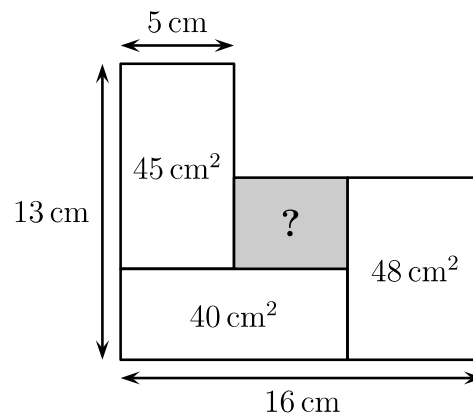
(A) 26   (B) 40   (C) 43   (D) 47   (E) 56

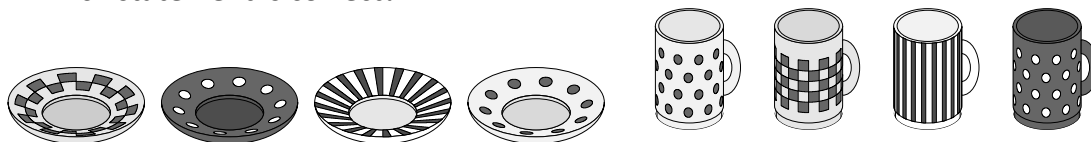
19. The diagram shows four touching rectangles.

What is the area of the shaded rectangle?

(A) 12 cm^2 (B) 14 cm^2 (C) 16 cm^2 (D) 18 cm^2 (E) 20 cm^2

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20. Simon takes four cups out of the cupboard and puts them randomly on the four saucers.
Which statement is correct?

(A) It is certain that none of the 4 cups stands on its matching saucer.

(B) It is certain that exactly 1 cup stands on its matching saucer.

(C) It is impossible for exactly 2 cups to stand on its matching saucer.

(D) It is impossible for exactly 3 cups to stand on its matching saucer.

(E) It is impossible for all 4 cups to stand on its matching saucer.

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21. A grandmother has some candies. She decides to divide them up amongst her grandchildren so that each has a bag containing same number of candies. She puts the largest possible number of candies in each bag and, when she is done, she sees that there are 20 candies in each bag and 12 candies are left over.

What is the smallest possible number of candies she could have?

(A) 52   (B) 232   (C) 272   (D) 411   (E) 432

22. Dan plans to cut a rope into 12 equal pieces and marks points where he needs to cut. Muhammad plans to cut the same rope into 16 equal pieces and marks points where he needs to cut. Then Maya cuts the rope at all the marked points.

How many pieces does Maya get?

A) 24   (B) 25   (C) 27   (D) 28   (E) 29

23. Emma is playing with the seven caterpillar puzzle pieces, as shown below. She wants to build a caterpillar that has one head, one tail and either one, two or three puzzle pieces in between.

How many different caterpillars could Emma build?

A) 10   (B) 14   (C) 16   (D) 18   (E) 20

24. Ava writes a three-digit number on the whiteboard.
Then Brandon writes a fourth digit to the right of the previous ones.

He says "Look! The number increased by 2024".

What digit did Brandon write?

A) 2   (B) 3   (C) 4   (D) 8   (E) 9