Kangaroo 2017 Benjamin

(6th and 7th grade)

Maunulan yhteiskoulu
HELSINGIN MATEMATIIKKALUKIO

NAME _____ CLASS _____

Points: _____ Kangaroo leap: _____

Separate this answer sheet from the test. Write your answer under each problem number.

For each right answer you get 3, 4, or 5 points. There is exactly one correct answer for each problem.

For each wrong answer, ¼ of the points of the problem will be deducted, for example for a 4-point problem -1 point. If you leave the answer empty, no deduction will be made.

There are two goals: to get as many points as possible, or to get as many consecutive right answers as possible.

3 points

PROBLEM	1	2	3	4	5	6	7
ANSWER							

4 points

PROBLEM	8	9	10	11	12	13	14
ANSWER							

5 points

PROBLEM	15	16	17	18	19	20	21
ANSWER							

Contest not to be held before 16th of March.
Logo design by Petra Siilanen.

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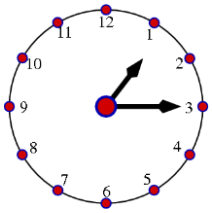
3 points

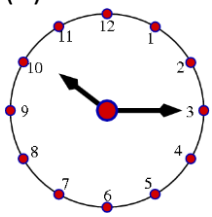
1.

Now it is a quarter past one o'clock.

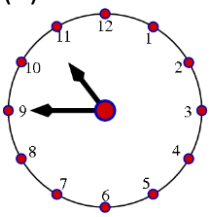


What time was it two and a half hours ago?

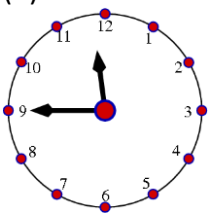
(A)



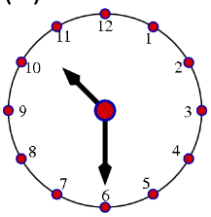
(B)



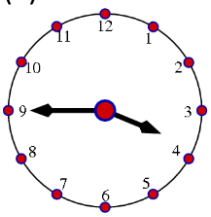
(C)



(D)

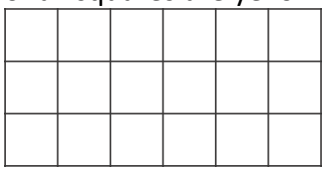


(E)



2.

Anssi colours the squares of the rectangle shown so that one third of all squares are blue and half of all squares are yellow. The rest of the squares are to be coloured red.



How many squares will Anssi colour red?

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

3.

A fly has six legs, a spider has eight legs, a chicken has two legs and a cat has four legs. Together three flies and two spiders have as many legs as nine chickens and …

(A) two cats (B) three cats (C) four cats (D) five cats (E) six cats

4.

Yasiin knows that $1111 \times 1111 = 1234321$. How much is 1111×2222?

(A) 3456543 (B) 2345432 (C) 2234322 (D) 2468642 (E) 4321234

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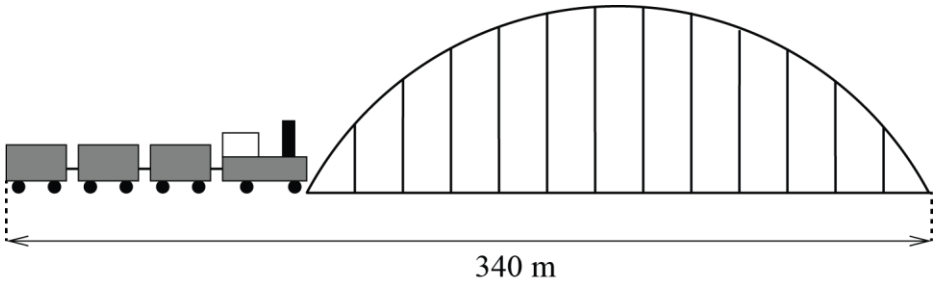
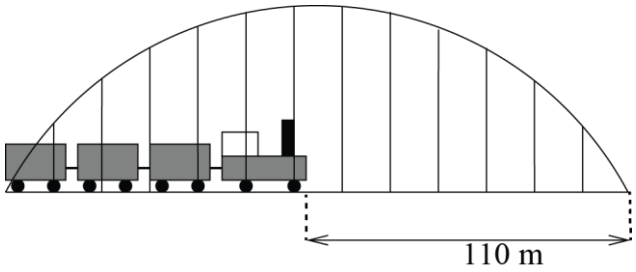
5.

How long is the train?

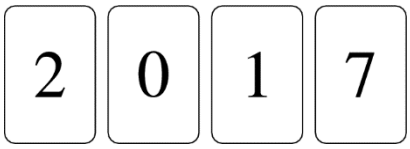




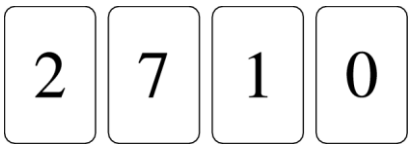
(A) 55 m (B) 115 m (C) 170 m (D) 220 m (E) 230 m

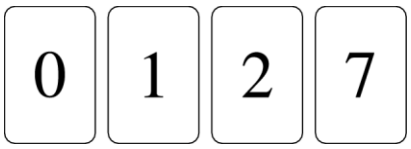
6.

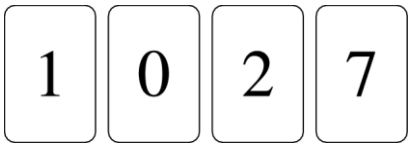
Aino has four cards in a row as shown in the picture.

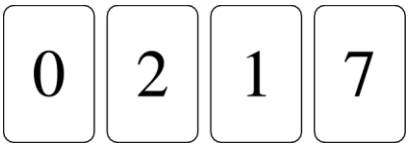


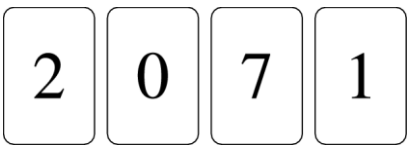
Which row of cards can she not obtain if she can only swap two cards?

(A)


(B)


(C)


(D)


(E)


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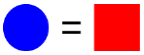
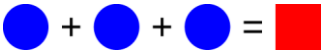
7.

It is known that 

Which one of the following is true?

(A) 

(B) 

(C) 

(D) 

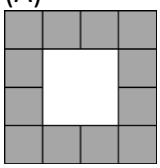
(E) 

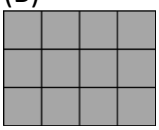
4 points

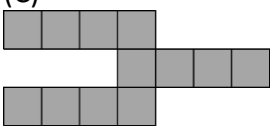
8.

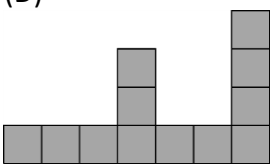
Adna has four pieces of this shape: 

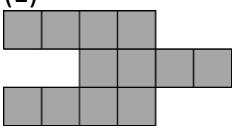
Which picture can she not make from these four pieces?

(A) 

(B) 

(C) 

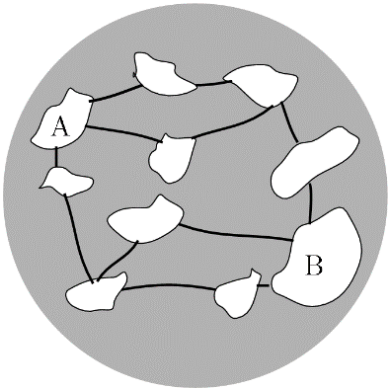
(D) 

(E) 

9.

On a planet there are ten islands and twelve bridges as shown in the picture. All bridges are open for traffic.

What is the smallest number of bridges that must be closed in order to stop the traffic between A and B?



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

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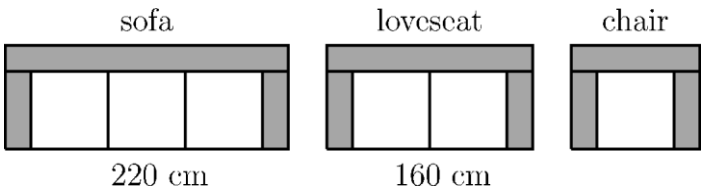
10.
Jere went hiking in the mountains for five days. He started on Monday and his last trip was on Friday. Each day he walked 2 km more than the day before. When the tour was over, his total distance was 70 km. What distance did Jere walk on Thursday?

(A) 12 km (B) 14 km (C) 16 km (D) 18 km (E) 20 km

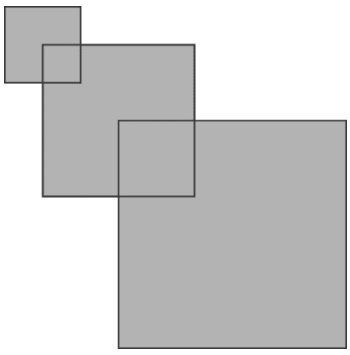
11.
A furniture store is selling sofas, loveseats and chairs made of identical modular pieces as shown in the picture which is from above. Including the armrests, the width of the sofa is 220 cm and the width of the loveseat is 160 cm.



What is the width of the chair?

(A) 60 cm (B) 80 cm (C) 90 cm (D) 100 cm (E) 120 cm

12.
Eemi drew three squares and coloured them as shown in the picture. The side length of the smallest square is 2 cm. The second one has side length 4 cm and a vertex is placed in the centre of the smallest square. The biggest one has side length 6 cm and a vertex is placed in the centre of the second square. What is the area of the coloured figure?



(A) 16 cm^2 (B) 27 cm^2 (C) 32 cm^2 (D) 51 cm^2 (E) 56 cm^2

13.

Maria wrote all numbers from 1 to 20 in a row and got the 31-digit number 1234567891011121314151617181920. Then she deleted 24 of the 31 digits so that the remaining number was as large as possible. Which number did she get?

(A) 9671819 (B) 9567892 (C) 9781920 (D) 9912345 (E) 9818192

14.

A bag contains only red marbles and green marbles. For any five marbles Tuomas picks, at least one is red. For any six marbles he picks, at least one is green. What is the largest number of marbles that the bag can contain?

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

5 points

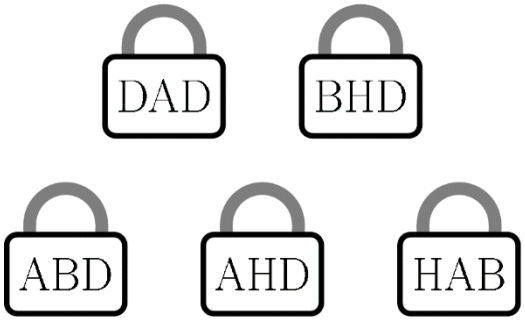
15.

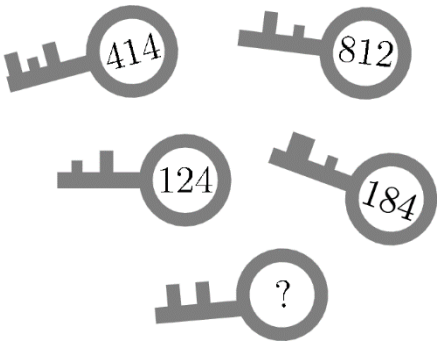
Daniel wants to prepare a schedule for his jogging. He wants to jog exactly twice a week, and on the same days every week. He never wants to jog on two consecutive days. How many such schedules are there?

(A) 16 (B) 14 (C) 12 (D) 10 (E) 8

16.

For each of the five padlocks, there is only one fitting key. There is a code on every key: numbers on the keys refer to the letters on the padlocks.





What is written on the last key?

(A) 382 (B) 282 (C) 284 (D) 823 (E) 824

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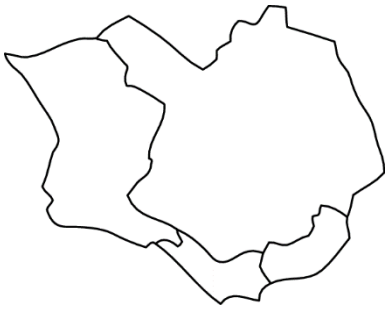
17.
Four teachers scored goals in a handball match. All of them scored a different number of goals. Among the four Harri was the one who scored the least number of goals. The other three teachers scored 20 goals in total. What is the largest number of goals Harri could have scored?

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

18.
Ten kangaroos stood in a line as shown in the picture. Suddenly two facing kangaroos standing next to each other exchanged places by jumping past each other. This was repeated until no further jumps were possible. How many exchanges were made?

(A) 15 (B) 16 (C) 18 (D) 20 (E) 21

19.
Amra has four different coloured pencils and she wants to use them to colour the map of an island as shown in the picture. The island is divided into four nations and if two nations share a common border, they cannot have the same colour. Each nation should be coloured with one colour. In how many ways can Amra colour the map of the island?



(A) 12 (B) 18 (C) 24 (D) 36 (E) 48

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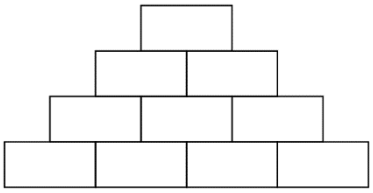
20.

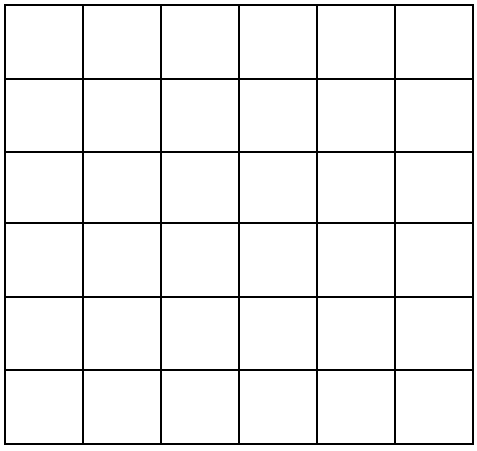
Aku wants to write an integer in each box of the diagram so that each number is the sum of the two numbers in the boxes immediately underneath. What is the largest amount of odd numbers that Aku can write?



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

21.

In each cell of a 6 X 6 board there is exactly one lamp. We say that two lamps in this board are neighbors if they lie in cells that have a common side. Initially some lamps are lit and, each minute, every lamp having at least two lit neighboring lamps is lit. What is the least number of lamps that need to be initially lit, in order to ensure that, eventually, all lamps are lit?



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