



Till läraren

Välkommen till Kängurutävlingen – Matematikens hopp 2023 *Ecolier*

- Tävlingen genomförs under perioden 16 mars – 24 mars. *Uppgifterna får inte användas tidigare.*
- Sista dag för redovisning av antalet deltagare är den *31 mars*. Du får då tillgång till facit och ett kalkylblad där du matar in elevernas svar och sedan får du en sammanställning av klassens resultat.
- Redovisa resultatet senast *28 april*.
- *Tävlingen är individuell* och eleverna får arbeta i 60 minuter. De tre delarna ska genomföras vid *ett och samma tillfälle*.
- Eleverna behöver ha tillgång till papper för att kunna göra anteckningar och figurer. Linjal behövs inte.
- *Miniräknare eller sax får inte användas. Observera att telefoner, datorplattor och datorer inte heller får användas.*
- Läs igenom problemen själv i förväg så att eventuella oklarheter kan redas ut.
- Kontrollera att kopiorna blir tillräckligt tydliga så att nödvändiga detaljer syns.
- Besök *Kängurusidan* på ncm.gu.se/kanguru där vi publicerar eventuella rättelser och ytterligare information. Där finns också information om hur kalkylbladet fungerar.
- Samla in problemformulären efter tävlingen. Problemen får inte spridas utanför klassrummet förrän efter 28 april, men ni får gärna arbeta med problemen i klassen.

Mikael Passares stipendium

Mikael Passare (1959–2011) var professor i matematik vid Stockholms universitet. Han hade ett stort intresse för matematikundervisning på alla nivåer och var den som tog initiativ till Kängurutävlingen i Sverige. Mikael Passares minnesfond har instiftat ett stipendium för att uppmärksamma elevers goda matematikprestationer. Information om hur du nominerar elever kommer tillsammans med facit och kommentarer.

Lycka till med årets Känguru!

e-post: kanguru@ncm.gu.se

För administrativa frågor, vänd dig till Ann-Charlotte Forslund:

Ann-Charlotte.Forslund@ncm.gu.se

031–786 69 85

För innehållsfrågor, vänd dig till Ulrica Dahlberg eller Johan Häggström:

ulrica.dahlberg@ncm.gu.se

johan.haggstrom@ncm.gu.se



Svarsblankett

Markera ditt svar i rätt ruta

Uppgift	A	B	C	D	E	Poäng
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
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SUMMA						

Namn:.....

Klass:.....

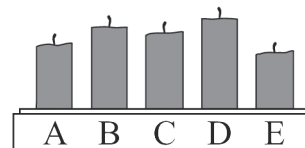
Kängurutävlingen – Matematikens hopp 2023

Ecolier



Three points problems

- 1 Akira lits five identical candles all at the same time. They stopped burning at different times and now look as shown in the picture.



Which candle stopped burning first?

- A: A B: B C: C D: D E: E

Frankrike

- 2 The two coins with the question mark on have the same value.

What is this value?

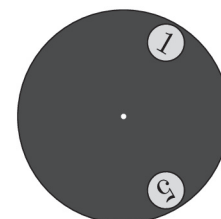
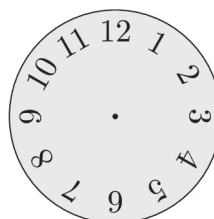
$$\text{20} + \text{10} + \text{10} + \text{?} + \text{?} + \text{1} = 51$$

- A: 1 B: 2 C: 5 D: 10 E: 20

Danmark

- 3 A grey circle with two large holes in it is put on top of a clock-face, as shown. The grey circle is turned around its center.

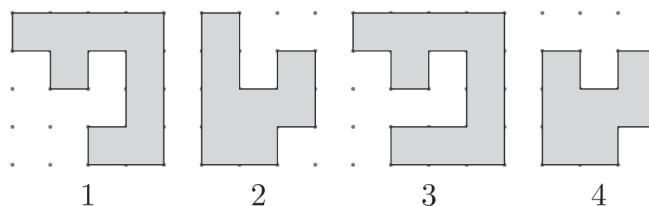
Which two numbers is it possible to see at the same time?



- A: 4 and 9 B: 5 and 9 C: 5 and 10 D: 6 and 9 E: 7 and 12

Danmark

- 4 Alice has these puzzle pieces:



Which two pieces can she put together to form this square?

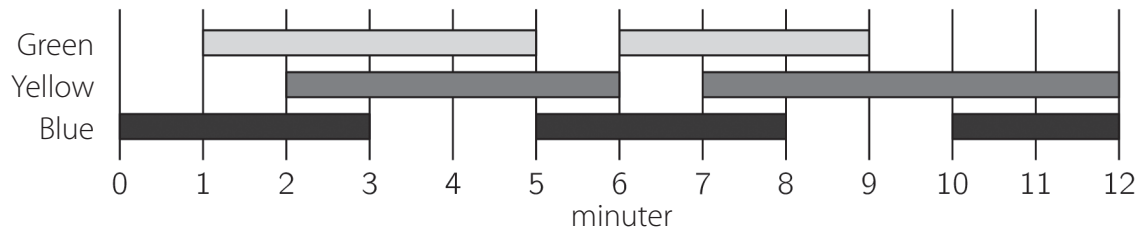


- A: 1 and 2 B: 1 and 3 C: 1 and 4 D: 2 and 3 E: 2 and 4

Danmark



- 5 A light engineer in the theatre turns the lights on and off. She uses the plan shown.



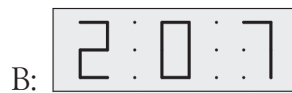
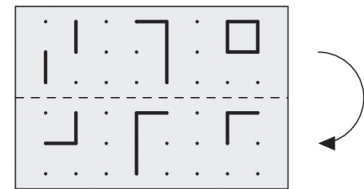
How long in total are exactly 2 of the lights on at the same time?

- A: 2 min B: 6 min C: 8 min D: 9 min E: 10 min

Slovakien

- 6 Kristoffer folds the transparent paper along the dashed line.

What can he then see?



Danmark

- 7 There are 19 students standing in a line. Th teacher counts them as 1, 2, 1, 2, 1, 2...

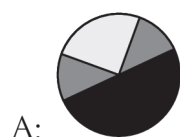
If those students belonging to number 2 were asked to move out of the line, how many students are left in the line?

- A: 11 B: 12 C: 9 D: 10 E: 13

- 8 Danny glued the two pieces of paper on top of the black circle on the right.



What can he *not* obtain?



Tyskland



Four points problems

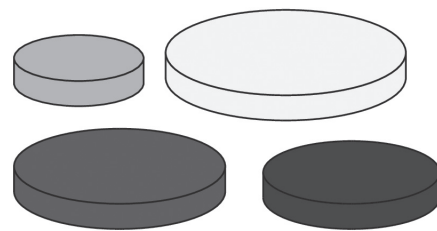
9

$$1 + 2 + 4 + 8 \neq 3 + 5 + 8 + 9$$

What two numbers must interchange if we want to write = instead of \neq between the expressions?

- A: 2 and 8 B: 4 and 9 C: 4 and 8 D: 8 and 3 E: 1 and 5

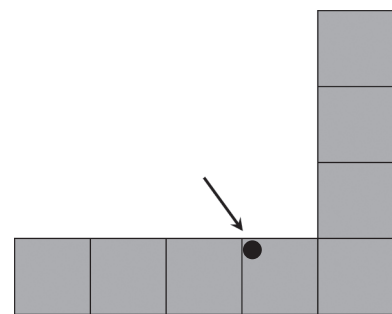
- 10 Anna has four discs of different sizes. She wants to build a tower of three discs so that every disc is smaller than the disc below it. How many *different* towers can Anna make?

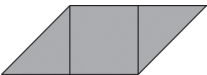
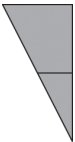
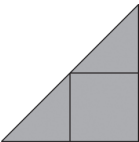
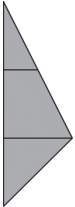
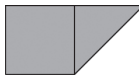


- A: 1 B: 2 C: 4 D: 5 E: 6

Slovenien

- 11 The shape on the right is covered with the five pieces below. Which piece will cover the dot?



- A:  B:  C:  D:  E: 

Grekland

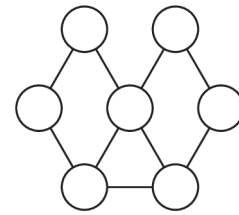
- 12 There are six weights of 1, 2, 3, 4, 5 and 6 kg. Ellen puts five of them on the scales and puts one weight aside. The scales balance. Which weight did she put aside?



- A: 1 kg B: 2 kg C: 3 kg D: 4 kg E: can't be sure



- 13 Helena wants to paint the circles in the picture.
She wants to paint any two circles connected with a line in different colours.

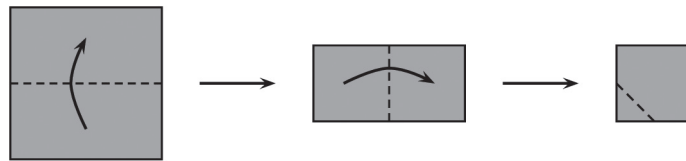


What is the smallest number of colours she needs?

- A: 2 B: 3 C: 4 D: 5 E: 6

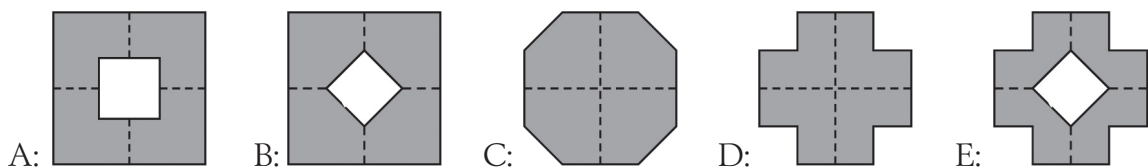
Ungern

- 14 Rebecka folds a square piece of paper twice.
Then she cuts off one corner.



Next, she unfolds the paper.

What does the paper look like once unfolded?



Slovakien

- 15 There are 8 cars waiting in a queue for the ferry.
Every car contains either 2 or 3 people.
There are 19 people in total waiting for the ferry.

How many cars contain exactly 2 people?

- A: 2 B: 3 C: 4 D: 5 E: 6

Norge

- 16 The Metro line has 6 stations: A, B, C, D, E, and F.
The train stops at every station.
When it reaches one of the two end stations, it changes its direction.



The train driver started driving at station B and her first stop was station C.

Which station will be her 96th stop?

- A: A B: B C: C D: D E: E

Grekland



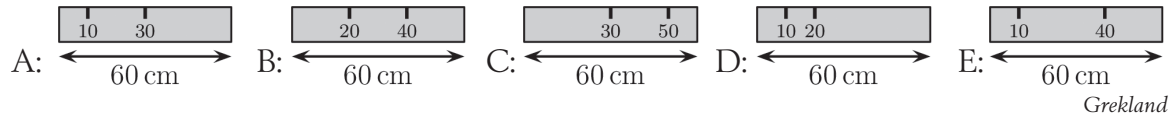
Five points problems

17 Ali has a 60 cm ruler.

Unfortunately, some of the markings have faded away.

He is able to measure any of the lengths 10, 20, 30, 40, 50 and 60 cm using his ruler only once.

Which is Ali's ruler?



18 Six girls and two boys are standing in a line.



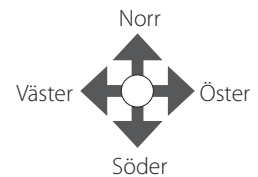
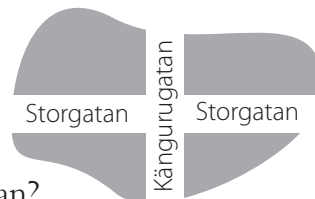
Amongst any three consecutively numbered children, exactly one is a boy.

Which number is a boy?

- A: 1 B: 2 C: 3 D: 4 E: 5

Grekland

19 There are 7 houses north of Storgatan,
8 houses east of Kängurugatan and
5 houses south of Storgatan



How many houses are west of Kängurugatan?

- A: 4 B: 5 C: 6 D: 7 E: 8

Grekland

20 Hermione, Harry and Ron always walk into the common room one at a time.

Hermione is never first, Harry is never second and Ron is never third.

In how many different orders could they walk in?

In how many different orders could they walk in?

- A: 1 B: 2 C: 3 D: 4 E: 6

Ungern

21 There are five clocks on the wall.

It is known that one clock is an hour fast,
one clock is an hour slow, one clock shows the correct time
and two clocks have stopped.

Which clock shows the correct time?





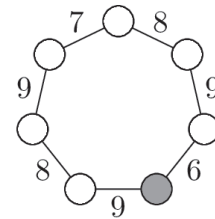
- 22 Agaton and Buster have 9 marbles each.
 Together, they have 8 red and 10 blue marbles.
 Buster has twice as many blue marbles as red marbles.

How many blue marbles does Agaton have?

- A: 3 B: 4 C: 5 D: 6 E: 0

Brasilien

- 23 Teacher Olena wants to write the numbers 1 to 7 in the circles.
 Inside each circle she writes one number.
 She wants the sum of the numbers in two circles that are next
 to each other to be as shown.



What number must she write inside the shaded circle?

- A: 1 B: 2 C: 3 D: 4 E: 5

Grekland

- 24 Maria has shaded exactly 5 cells in a grid.
 She challenges 5 of her friends to guess which cells she has shaded.
 The grids they have drawn are shown below.
 Maria looks at them and says:
 "One of you is right and each of the rest of you has four cells correct."

Which is the correct answer?

A:

B:

C:

D:

E:

Katalonien