Till läraren

Välkommen till Kängurutävlingen – Matematikens hopp 2025
Benjamin

- Tävlingen genomförs under perioden 20 – 28 mars. *Uppgifterna får inte användas tidigare.*
- Du får tillgång till facit och ett kalkylblad, lösenord finns på mailet du fått. Du matar in elevernas svar och sedan får du en sammanställning av klassens resultat.
- Redovisa resultatet senast *30 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 30 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:
ulrica.dahlberg@ncm.gu.se

Svarsblankett

Markera ditt svar i rätt ruta

Uppgift	A	B	C	D	E	Poäng
1						
2						
3						
4						
5						
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24						
					SUMMA	

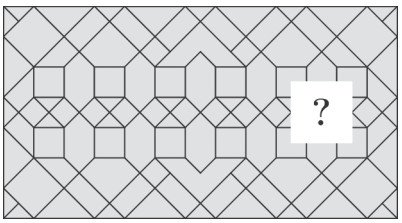
Namn:.....

Klass:.....

Kängurutävlingen – Matematikens hopp 2025
Benjamin

Three point problems

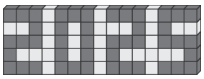
1 Which of the pieces shown would complete the pattern?

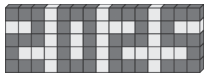
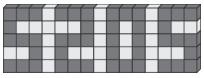
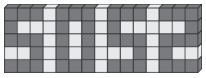


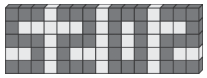
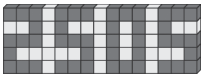
A  B  C  D  E 

[*Iran*]

2 Anna has built a wall that displays the year 2025. Bella stands on the other side of the wall. What does Bella see?



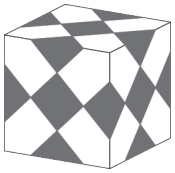
A  B  C 

D  E 

[*Denmark*]

3 Ella decorates a white cube by gluing identical grey squares on it, as shown in the picture. All faces of the cube look the same.

How many grey squares in total did Ella use?

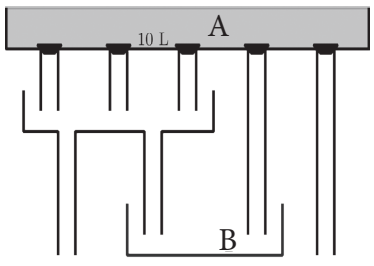


A 30 B 18 C 16 D 15 E 14

[*Slovakia*]

4 Container A holds 10 litres of water. All five plugs at the bottom of container A are taken out at the same time and the water flows out.

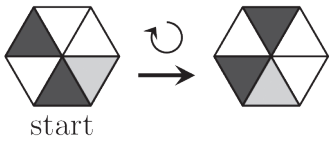
What volume of water flows into container B?



A 3 liters B 4 liters C 5 liters D 6 liters E 8 liters

[*Switzerland*]

5 Thea rotates a piece of paper divided into six equal parts. When the paper is rotated, it is turned clockwise one part, as shown in the diagram.

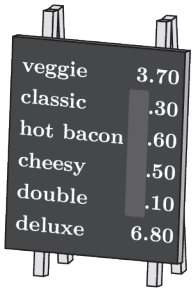


What does the sheet of paper look like after a total of eight rotations?

A  B  C  D  E 

[*Germany*]

6 The menu of a burger restaurant is written on a board. However, the rain has washed away some of the numbers. The burgers are ordered by price (in euro).



Which of the following is the price of one of the burgers?

A: 4.10 B: 5.50 C: 5.60 D: 6.30 E: 6.60

[*Germany*]

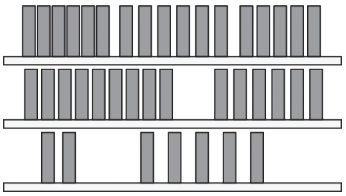
7 Six children took part in a race.
Ali finished in the third place.
Boel finished sixth, just behind Erik.
Fatima finnished between Ali and Erik.
Diana overtook Charles right before the finish line.

Who won the race?

A: Ali B: Charles C: Diana D: Erik E: Fatima

[*Catalonia*]

8 A bookshelf with three shelves has
17 books on the top shelf,
15 books on the middle shelf, and
7 books on the bottom shelf.
Monika wants each shelve to have the same number of books. She also wants to move as few books as possible.



How many books should she move from the middle shelf to the bottom shelf?

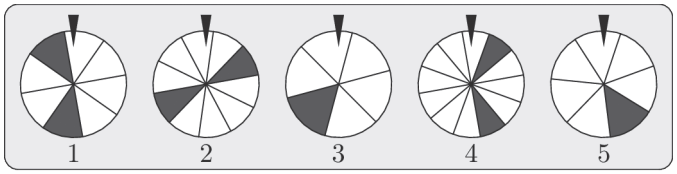
A: 6 B: 4 C: 3 D: 2 E: 51

[*Hong Kong*]

Four point problems

9 The picture shows five wheels of fortune. Each wheel is divided into a different number of identical parts. You will win a prize when the wheel is spun and then stops with the triangle above the wheel pointing to a part that is shaded.

Which wheel gives you the best chance of winning?



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

[*Norway*]

10 Vera has built a tower of blocks. Some blocks have numbers.
She wants to put numbers on the two empty blocks as well. She wants the number on each block in her tower to be at least 2 more than the number on the block below it.

In how many ways can Vera do this?

A: 3 B: 4 C: 5 D: 6 E: 7

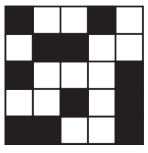
[*Germany*]

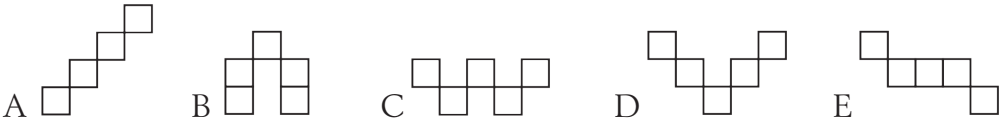
11 Three turtles participate in a 10-kilometre race. Each of them moves at a constant speed. When the first turtle finishes, the second turtle has covered $\frac{1}{4}$ of the distance, and the third turtle has covered $\frac{1}{5}$ of the distance.

How far from the finish line will the third turtle be when the second turtle finishes?

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

12 Which shape, or any rotation of the shape, can NOT be placed onto the white parts of the large square?





[*Germany*]

13 A school's swimming team is practicing for a relay competition. Five swimmers swam the same distance, one after the other. The pictures below show the times on their coach's stopwatch when each swimmer had finished their leg. The first swimmer needed 2 minutes and 8 seconds. When the last swimmer arrived the watch showed 10 minutes and 3 seconds.

Which one was the quickest swimmer?

A: the first B: the second C: the third D: the fourth E: the fifth

[*Germany*]

14 Each of the cards shown below have two 3-digit numbers written on them, but some of the digits cannot be seen as they are covered in ink.

On which card is the sum of the digits of both numbers the same?

A 

B 

C 

D 

E 

[*Greece*]

15 Hassan wants to write a 0 or a 1 in each cell of the diagram so that the sum of the numbers in each row, column and diagonal is 3. He has already written a 0 in one of the cells.

When he finishes, what will the sum of the numbers in the cells with a question mark be?

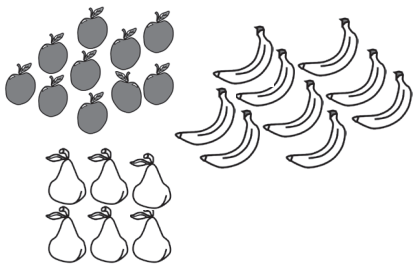
	?		
		0	
?			?
	?		

A: 1 B: 2 C: 3 D: 4 E: det går inte att beräkna

[*Poland*]

16 A magician had 10 apples, 9 bananas and 6 pears. One day he performed some magic and turned each of his pieces of fruit into one of the other two types. For example, he changed each apple into either a banana or a pear. He now has 15 apples, 7 bananas and 3 pears.

How many of the apples changed into a banana?



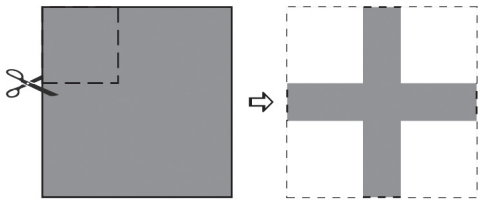
A: 3 B: 4 C: 5 D: 6 E: 7

[*Greece*]

Five point problems

17 Janina cuts four identical squares from the corners of a square sheet of paper, as shown.
The total area she cuts off is 16 cm^2 and the area of the cross that remains is 9 cm^2.

What is the perimeter of the cross?

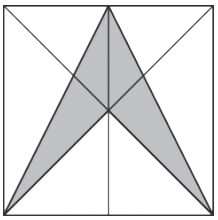


A: 9 cm B: 16 cm C: 20 cm D: 25 cm E: 32 cm

[*Brazil*]

18 The side-length of the square shown in the diagram is 10 cm
The line down in the middle of the square divides it into two equal rectangles.

What is the area of the shaded region?

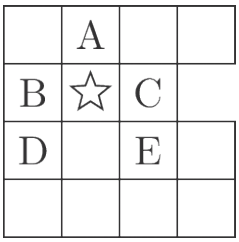


A: 12,5 cm^2 B: 25 cm^2 C: 30 cm^2 D: 40 cm^2 E: 50 cm^2

[*Spain*]

19 Johanna divides the figure shown into five equally shaped parts, each consisting of three squares.

The square containing which letter is in the same part as the square marked with a star?

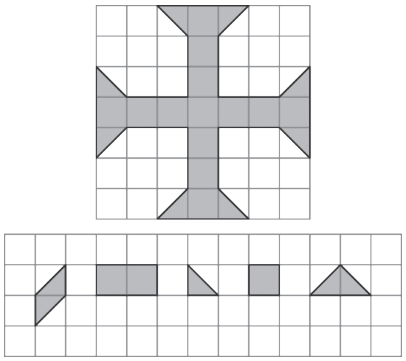


A: A B: B C: C D: D E: E

[*Hong Kong*]

20 Julio wants to construct the figure shown in the picture. He uses pieces shaped like the ones below the figure.
He has many copies ofeach piece and knows he can rotate them if needed.
The pieces must not overlap.

What is the smallest number of pieces he could use to construct the figure?

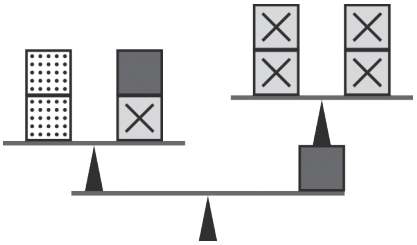


A: 11 B: 12 C: 13 D: 15 E: 17

[*Puerto Rico*]

21 Some blocks are balanced on top of each other, as shown. Blocks that are shaded in the same way have the same weight. William orders the three different types of square block from heaviest to lightest.

What order should he obtain?



A 

B 

C 

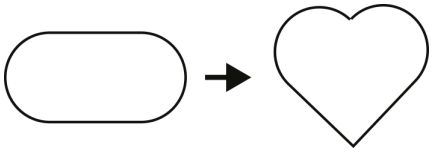
D 

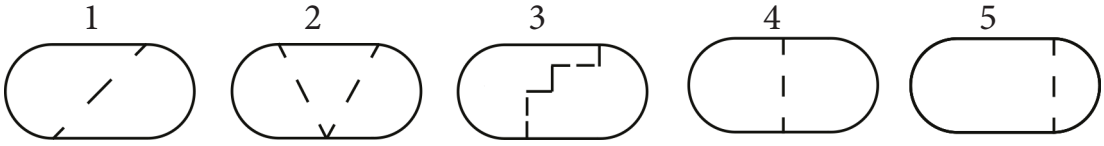
E 

[*Finland*]

22 Five paper templates are marked with dashed lines. By cutting along the lines, three of the templates can be puzzled into a heart without overlapping.

Which three templates are these?

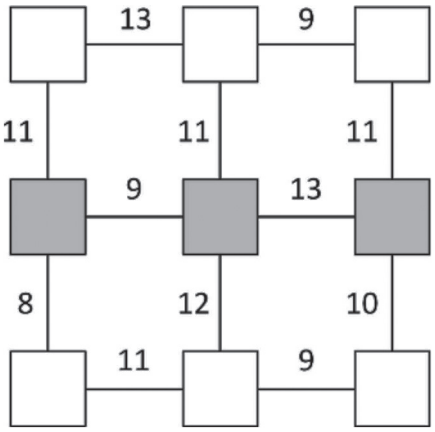




A: 1, 2, 3 B: 2, 3, 5 C: 3, 4, 5 D: 1, 3, 5 E: 1, 2, 4

23 Patricia wants to write the numbers from 1 to 9 into the squares in the diagram, with one number in each square. She wants the sum of the numbers in any two adjacent squares to be equal to the number shown on the line joining these squares.

What is the sum of the numbers she writes in the shaded row?



A: 16 B: 17 C: 18 D: 20 E: 21

[*Polen*]

24 Sara had three times as many chocolates as Anna.
Sara then gave a quarter of her chocolates to Anna.
Sara now has six more chocolates than Anna.

How many more chocolates than Anna did Sara have at the start?

A: 36 B: 30 C: 27 D: 24 E: 20

[*Iran*]