



Till läraren

Välkommen till Kängurutävlingen – Matematikens hopp 2026

Student

- Tävlingen genomförs under perioden 19 – 27 mars. *Uppgifterna får inte användas tidigare.*
- Du får tillgång till facit och ett kalkylblad. I kalkylbladet matar du in elevernas svar och får en sammanställning av klassens resultat. Facit öppnas klockan 12.00 på tävlingsdagen, lösenord till facit finns i mailet du fått.
- Redovisa resultatet senast 30 april. Efter det görs både problem och facit fritt åtkomliga.
- *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.
- 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						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
SUMMA						

Namn:.....

Klass:.....

Kängurutävlingen – Matematikens hopp 2026

Student



Three point problems

- 1 In a triangle, all the side lengths are integers. One side is 9 and another is 1.

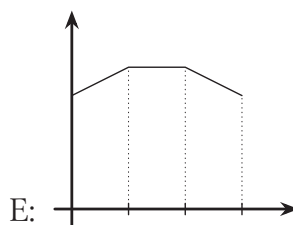
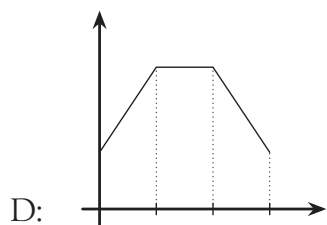
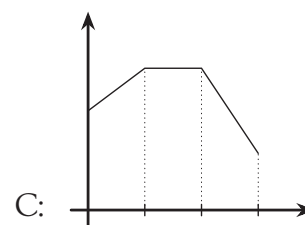
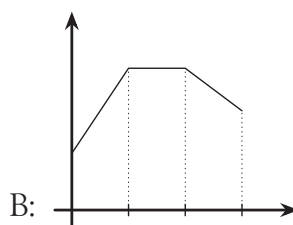
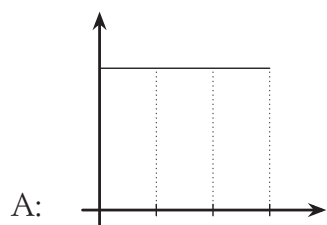
What is the length of the third side?

A: 5 B: 7 C: 9 D: 11 E: 13

[Georgia]

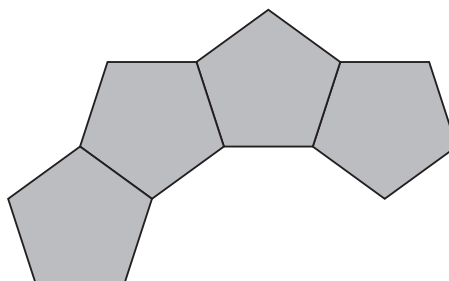
- 2 During a 30-minute jog, Mia's smartwatch reports the following:
- During the first ten minutes, her heart rate increased by 4 beats per minute, every minute.
 - During the next ten minutes, her heart rate remained the same.
 - During the last ten minutes, her heart rate decreased by 2 beats per minute, every minute.

Which of the following does the graph of her heart rate show?



[Malaysia]

- 3 Plates that are regular pentagons are placed next to each other so that they share edges and form a ring. The figure shows four of these plates.



How many plates are there in the complete ring?

A: 10 B: 11 C: 12 D: 14 E: 15

[Vietnam]



- 4 What is the largest number you can get by replacing the four empty squares in the expression $(\square + \square)^{(\square - \square)}$ with the numbers 2, 0, 2, and 6?

A: 2^4 B: 2^6 C: 2^8 D: 2^{10} E: 2^{12}

[Switzerland]

- 5 The store has the following special offer:
If you buy three items, you get the cheapest item for free. Julia chooses six pairs of socks, all with different prices. The unit prices are 2.90; 3.10; 3.50; 4.30; 4.60 and 4.90 euros.

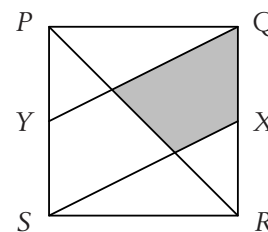
What is the maximum total value of the two pairs of socks she can get for free?

A: 6.60 euros B: 7.20 euros C: 7.40 euros D: 7.70 euros E: 8.10 euros

[Germany]

- 6 The picture shows a square $PQRS$. The points X and Y are the midpoints of the sides QR and PS , respectively.

How much of the square is shaded?



A: $\frac{1}{8}$ B: $\frac{1}{6}$ C: $\frac{1}{5}$ D: $\frac{1}{4}$ E: $\frac{1}{3}$

[Great Britain]

- 7 A hotel has nine available rooms. Each room can accommodate either three or four people. A group of 30 people will be staying at the hotel and will fill all the available rooms completely.

How many of the rooms have a capacity for four people?

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

[Indonesia]

- 8 How many three-digit numbers, abc , are there such that $a = \left(\frac{b}{c}\right)^2$?

A: 4 B: 8 C: 9 D: 10 E: 16

[Catalonia]

Four point problems

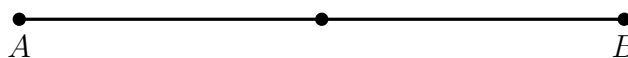
- 9 The number $\underbrace{333 \dots 3}_{2026}$ is divided by 33.

What is the sum of the digits of the result?

A: 1111 B: 2025 C: 2026 D: 3039 E: none of the options



- 10 Two points P and Q are placed randomly on a line segment AB , and neither of them lies on the midpoint.



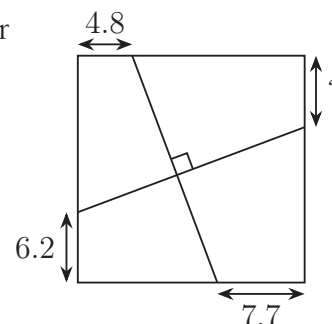
What is the probability that the line segment PQ contains the midpoint of AB ?

- A: $\frac{1}{4}$ B: $\frac{1}{3}$ C: $\frac{1}{2}$ D: $\frac{2}{3}$ E: $\frac{3}{4}$

[Australia]

- 11 The picture shows a square and two lines that are perpendicular to each other. The lengths of three line segments are given.

What is the length of the line segment marked with a question mark?



- A: 5,6 B: 5,9 C: 6,1 D: 6,3 E: 6,6

[Germany]

- 12 Five figures are placed between two parallel lines:

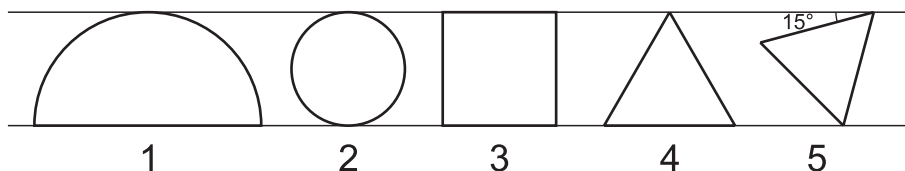


Figure 1 is a semicircle, figure 2 is a circle, figure 3 is a square, and figures 4 and 5 are equilateral triangles. The areas of each figure are S_1 , S_2 , S_3 , S_4 , and S_5 .

Which of the following statements is true?

- A: $S_1 > S_2 > S_3 > S_4 > S_5$ B: $S_1 > S_4 > S_3 > S_2 > S_5$ C: $S_1 > S_3 > S_2 > S_4 > S_5$
D: $S_1 > S_3 > S_4 > S_2 > S_5$ E: $S_1 > S_3 > S_2 > S_5 > S_4$

- 13 Two regular dice are rolled and the product of the numbers obtained is noted.

- Anne gets 1 point if the product is divisible by 4.
- Drew gets 1 point if the product is divisible by 6.

What is the probability that both Anne and Drew get 1 point?

- A: $\frac{1}{18}$ B: $\frac{1}{9}$ C: $\frac{5}{36}$ D: $\frac{7}{36}$ E: $\frac{2}{9}$

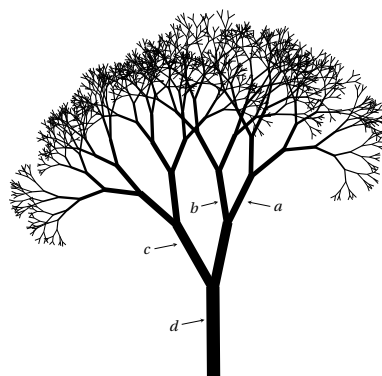
[Australia]



- 14 At each place where this tree branches in two, the combined cross-sectional area of the two new branches is equal to the cross-sectional area of the original branch.

The cross-sections of the branches at points a , b , c , and d are circles with diameters of 1 cm, 4 cm, 8 cm, and x cm, respectively.

What is the value of x ?

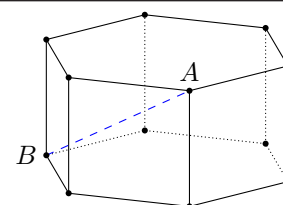


- A: 9 B: 10 C: 11 D: 12 E: 13

[Finland]

- 15 The hexagonal prism has two regular hexagons and six squares as lateral faces. All edges are 1 unit long.

What is the length of the line segment AB shown?



- A: $\sqrt{2}$ B: $\sqrt{3}$ C: $\sqrt{4}$ D: $\sqrt{5}$ E: $\sqrt{6}$

[Australia]

- 16 Oleg rolled 100 regular dice and multiplied all the numbers that came up on the top sides. The resulting product was 670.

What is the least number of times the number 6 must have appeared?

- A: 10 B: 12 C: 24 D: 30 E: 35

[Ukraine]

Five point problems

- 17 The integers $1, 2 \dots 40$ are written on a board. David performs 39 operations on these numbers. At the n :th operation, the following applies:
- if n is not a multiple of 7, he chooses two numbers a and b , erases them and writes the number $a + b - 1$
 - if n is a multiple of 7, he chooses two numbers a and b , erases them and writes the number $a + b + 5$.

What number remains at the end?

- A: 781 B: 801 C: 811 D: 819 E: 821

[India]



- 18 The real numbers a and b are such that $9^a = 11^b = 9801$.

What value does $\frac{1}{a} + \frac{1}{b}$?

- A: $\frac{1}{2}$ B: $\frac{3}{4}$ C: 1 D: 2 E: 3

[Cameroon]

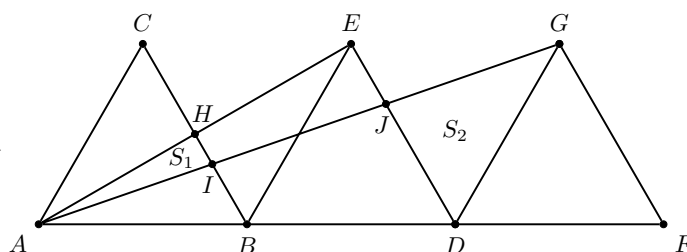
- 19 The sum of 15 consecutive natural numbers is equal to the sum of the next 9 natural numbers.

What is the smallest of these 24 numbers?

- A: 10 B: 11 C: 12 D: 13 E: 14

[Switzerland]

- 20 Three congruent equilateral triangles are drawn on the line segment AF , as shown in the figure. Denote the area of $\triangle AHI$ by S_1 and the area of $\triangle DGJ$ by S_2 .



What is the relationship? $S_1 : S_2$?

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

[China]

- 21 A function f has the property that for every real number x ,

$$f(x+10) = f(x)$$

and

$$f(6-x) = -f(x).$$

The value of $f(27)$ is 9.

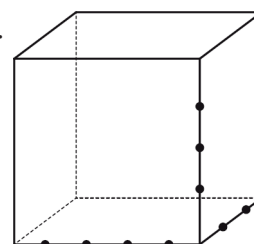
What is the value of $f(9) + f(13)$?

- A: -27 B: -9 C: -3 D: 3 E: 9

[Australia]

- 22 Nine points are marked on the edges of a cube, as shown in the figure.

How many triangular pyramids are there that have their vertices among these nine points?



- A: 24 B: 36 C: 48 D: 60 E: 72

[Poland]



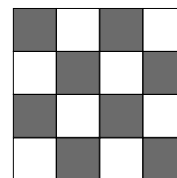
- 23 For a natural number n betecknar a_n denotes the largest integer less than or equal to $\sqrt{n}$.

What is the value of $a_1 - a_2 + a_3 - a_4 + a_5 - a_6 + \dots + a_{2025} - a_{2026}$?

A: 0 B: 2026 C: -2026 D: 22 E: -22

[Polen]

- 24 On a 4×4 board, colored as in the picture, we want to make all the squares white by repeatedly performing the following operation: select four squares that form a 2×2 square and change the color of these four squares.



What is the minimum number of times this operation must be performed?

A: 4 B: 6 C: 8 D: 16

E: It is not possible to do this.

[Mexico]