Logics

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1. Holger writes the numbers up to 40 in the table in the same way as shown.
Which of the pieces A to E can he then cut from the table?

1	2	3	4	5	6	7	8
9	10	11	12				

(A)

12	
22	23
	33

(B)

12	
20	21
	28

(C)

12	
20	21
	29

(D)

12	
21	22
	30

(E)

12	
21	22
	31

2. Matchsticks are arranged to form numbers as shown. To form the number 15 one needs 7 matchsticks.
To form the number 8 one needs the same amount.
What is the biggest number that one can build using 7 matchsticks?

(A) 31 (B) 51 (C) 74 (D) 711 (E) 800

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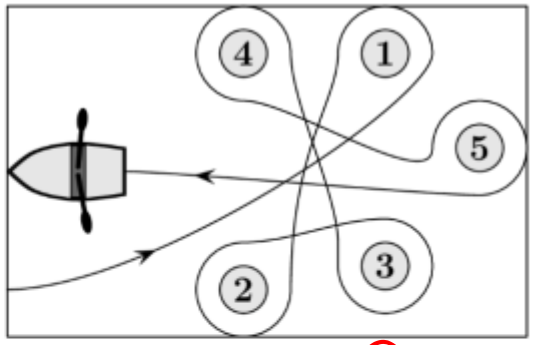
1. What is (20+22) ÷ (20−22) = ?

(A) -42 (B) -21 (C) -2 (D) 22 (E) 42

2. Meike paddles around five buoys with her boat (see diagram).
Which of the buoys does she paddle around in a clockwise direction?

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

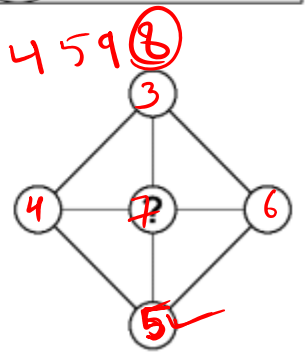


3. Beate arranges the five cards so that the smallest nine-digit number is created. Which card is furthest on the right?

(A) 4 (B) 8 (C) 31 (D) 59 (E) 107

4. The numbers 3, 4, 5, 6, 7 are written inside the five circles of the shape. The product of the numbers in the four outer circles is 360. Which number is in the inner circle?

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



$(20+22) \div (20-22) = ?$

$42 \div (-2) \Rightarrow -(\quad)$

$-(42 \div 2)$

$(-42 \div 2)$

$(-42) \div (-2)$

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28. Mowgli asks a bear and a panther which day of the week it is. The bear always lies on Monday, Tuesday and Wednesday. The panther always lies on Thursday, Friday and Saturday. On all other days they both always speak the truth. The bear says: „Yesterday was one of my lying days." The panther says: „Yesterday was also one of my lying days." On which day of the week did this conversation take place?

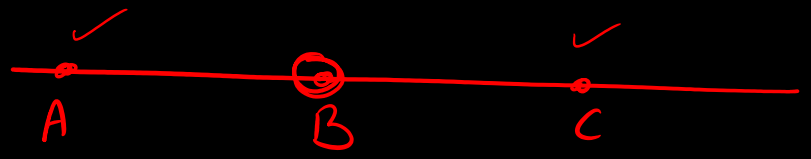
(A) Thursday (B) Friday (C) Saturday (D) Sunday (E) Monday

29. Some points are marked on a straight line. Renate marks another point between every pair of adjacent points. She repeats this process three more times.
Now 225 points are marked on the straight line. How many points were there to begin with?

(A) 10 (B) 12 (C) 15 (D) 16 (E) 25

30. In total there are 2022 kangaroos and some koalas living within seven parks. As many kangaroos live in each park as there are koalas in all other parks together. How many koalas in total live in the seven parks?

(A) 288 (B) 337 (C) 576 (D) 674 (E) 2022



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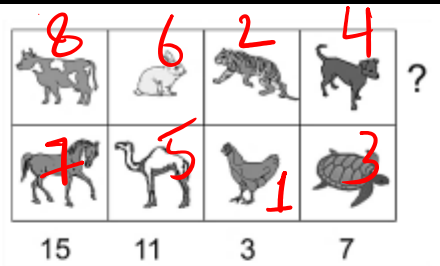
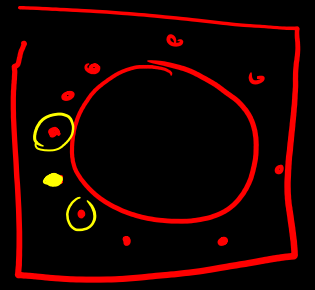
22. Each animal in the picture on the right represents a natural number greater than zero.
Different animals represent a different numbers.
The sum of the two numbers of each column is written underneath each column.
What is the maximum value the sum of the four numbers in the upper row can have?



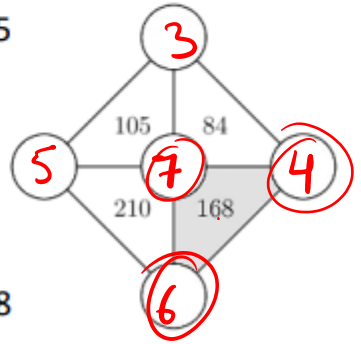
(A) 18 (B) 19 (C) 20 (D) 21 (E) 22

23. 30 people are sitting around a round table. Some of them are wearing a hat.
Those who do not wear a hat, have to speak the truth.
Those who wear a hat can either speak the truth or lie.
They all claim: „At least one of my two neighbouring people wears a hat."
What is the biggest number of people that do not wear a hat?

(A) 5 (B) 10 (C) 15 (D) 20 (E) 25



24. Kai has to insert the numbers 3, 4, 5, 6 and 7 into the five circles of the diagram on the right in the following way: The product of the three numbers in the vertices of each triangle has to be equal to the number stated within the triangle.
How big is the sum of the numbers in the vertices of the triangle with the number 168?



(A) 12 (B) 14 (C) 15 (D) 17 (E) 18

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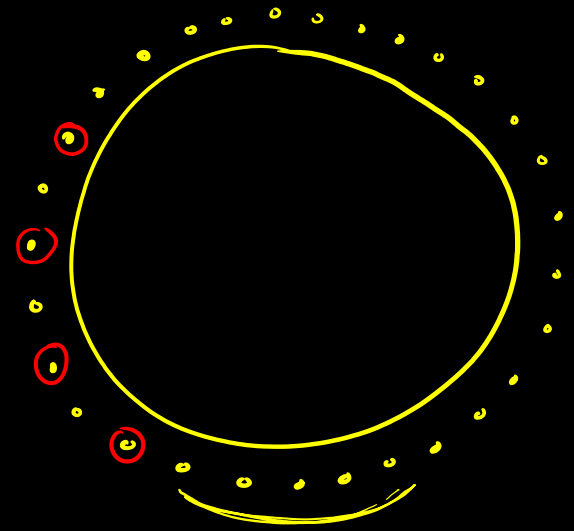

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Q1. Amit has $16p$ picture cards. If each picture card costs Rs. $3pq$, determine the cost of all picture cards.

Q2. Rohit covers $9y$ cm in one step, what is the distance moved by him in $7x$ steps?

Q3. The volume of a cuboid is given by the product of its length, breadth and height. The length of a cuboid is 3 times its breadth and the height is one-half of the length. Find its volume if breadth is y cm.

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④ length $= 2x^2y$ cm

breadth $= 3xy^2$ cm.

Area :-

$x^3 \times x^3$

$(x^3)^{x^2}$

⑤ The cost of painting a rectangular metal sheet is square of its area. If the length and breadth of the rectangle are $2xy$ and $3x^2y$, find the cost.

⑥ In a room there are x^2 rows of chairs and each raw contains $2x^2$ chairs. Find the total number of chairs in the room.

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(x), (y), (z)

(i) Let the number be x

(ii) $2x + 6 = 14$

(i) Let the number be y

(ii) $y + \frac{3}{5} y = 24$

multiply

(iii) $y + \frac{3}{5} y = 24$

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(a) $4x^2y^3z^5$

$\Rightarrow 4(2)^2(5)^3(3)^5$

$\Rightarrow 4 \times 4 \times 125 \times 245$

$\Rightarrow 486{,}000$

(b) $\dfrac{2x+3y}{4x-3y}$

$\Rightarrow \dfrac{2(2)+3(5)}{4(2)-3(5)}$

$\Rightarrow \dfrac{4+15}{8-15}$

$\Rightarrow \dfrac{19}{-7} \times \dfrac{(-1)}{(-1)} = \dfrac{-19}{7}$

$\Rightarrow \dfrac{-19}{7}$

$(-2) \times (-3) = +6$

$-3 \overline{)19}$

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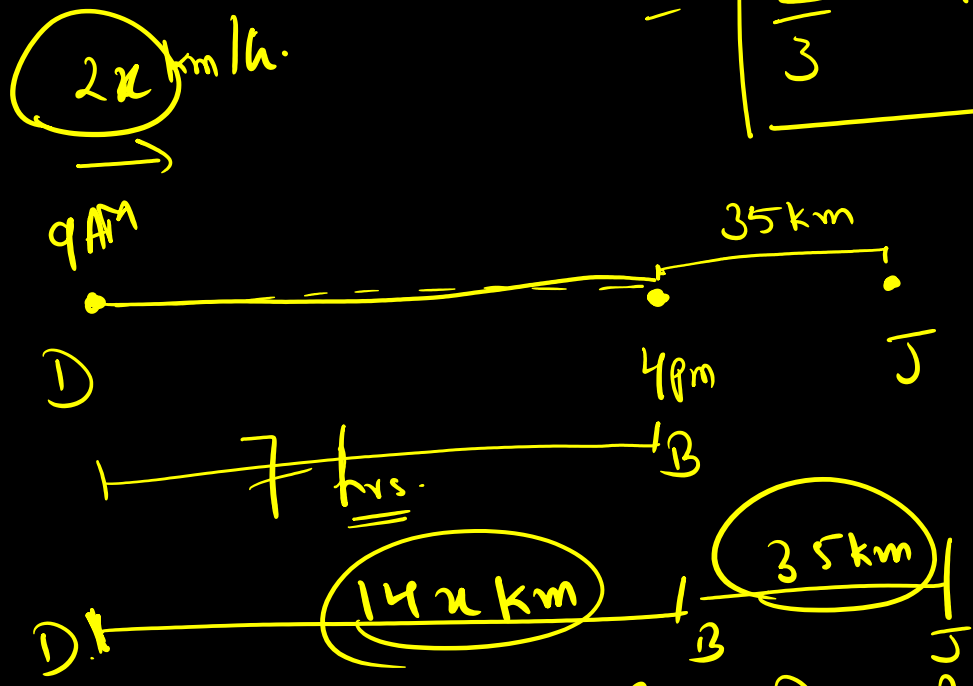
(4) Her marks in Science = x ✓

∴ Her marks in math = $\frac{2}{3}$ of x + 25 ✓

= $\frac{2}{3}x + 25$ ✓

(5)



Distance covered from D → B = $2x \times 7$ km = 14x km

Distance Between D & J = $14x + 35$ km

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Spends + Saving = Income

Rs x / day + Rs. y / week

5 weeks. ⇒ 35 days.

Rs. $35x$ + Rs $5y$

Income = $35x + 5y$

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 # 1. Matchsticks can be placed to form numbers, as shown below. For example, to form the number 15, we need 7 matchsticks. To form the number 8, we need the same number of matchsticks. What is the largest number that can be built with 7 matchsticks?

Batang mancis boleh disusun untuk membina nombor, seperti di bawah. Sebagai contoh, untuk membina nombor 15, kita perlukan 7 batang mancis. Untuk membina nombor 8, kita perlukan bilangan batang mancis yang sama. Apakah nombor terbesar yang boleh dibina dengan 7 batang mancis?

火柴可以用来组成数字，如下图所示。例如，要组成 15，我们需要 7 根火柴。要组成 8，我们也是需要相同数量的火柴。用 7 根火柴可以组成最大的数字是多少?

(A) 31 (B) 51 (C) 74 (D) 711 (E) 800

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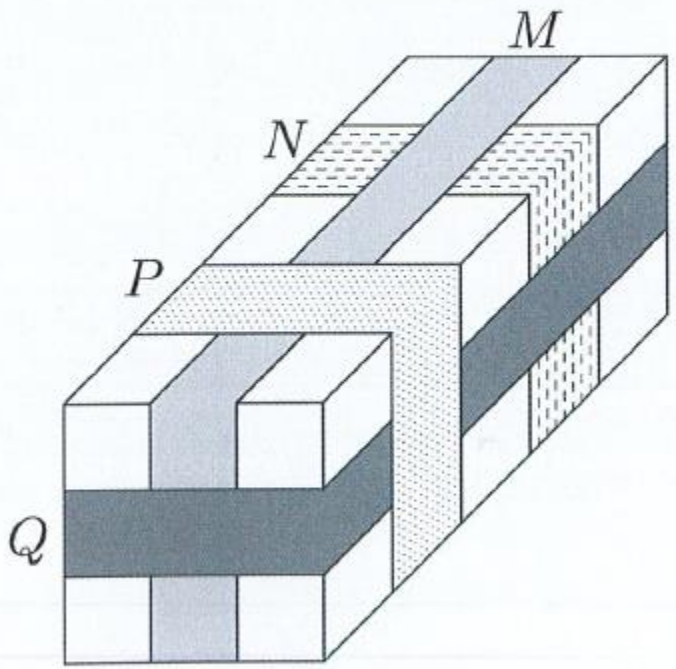
 # 2. The figure shows a parcel. Four tapes labelled M, N, P, and Q are placed around the parcel. In what order, from first to last, were the tapes placed?

Rajah berikut menunjukkan sebuah bungkusan. Empat pita berlabel M, N, P, dan Q dilekatkan di sekeliling bungkusan tersebut. Apakah turutan pita tersebut dilekatkan, dari pertama hingga terakhir?

图片显示一个包裹。四个标记为 M、N、P 和 Q 的胶带缠绕在包裹周围。请问胶带是按什么顺序，从第一个使用到最后一个的?



Q P

(A) M, N, Q, P (B) N, M, P, Q (C) N, Q, M, P (D) N, M, Q, P (E) Q, N, M, P

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 # 3. To the number 6, we add 3. Then we multiply the result by 2, and then we add 1. The final result is the same as which computation?

Nombor 3 ditambahkan kepada nombor 6. Kemudian, kita darabkan hasilnya dengan 2, dan seterusnya, kita tambahkan 1. Kiraan manakah yang sama dengan hasil yang kita dapati?

对于数字 6，我们加 3. 我们将其结果乘以 2，然后再加 1。最后的结果与哪个计算相同?

(A) $(6+3\times 2)+1$

(B) $6+3\times 2+1$

(C) $(6+3)\times(2+1)$

(D) $(6+3)\times 2+1$

(E) $6+3\times(2+1)$

$(6+3)\times 2+1$

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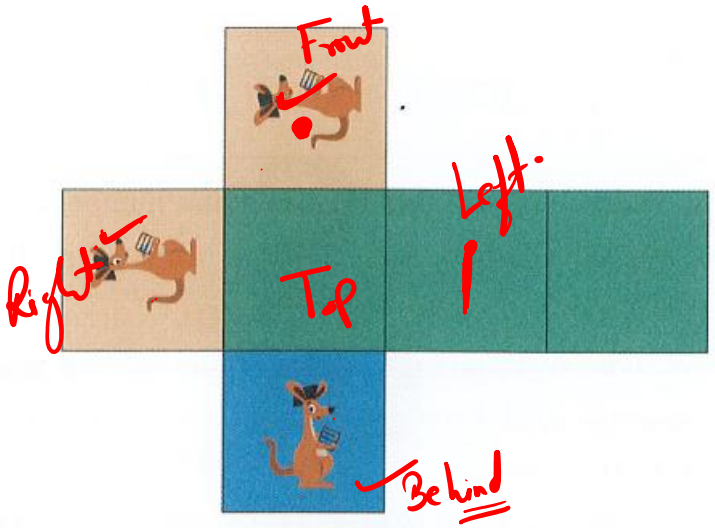
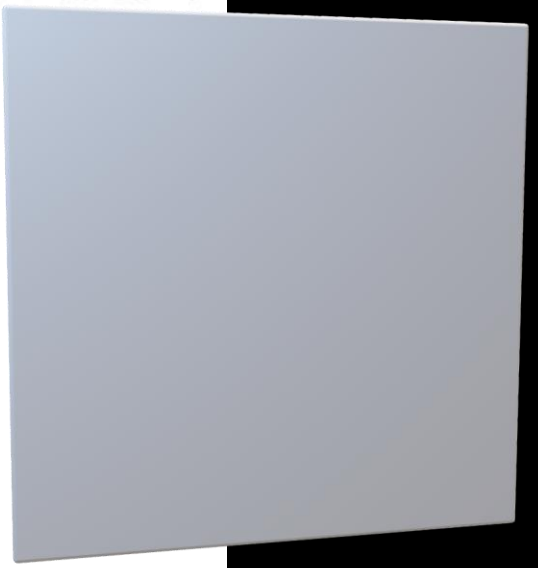
 # 4. Rosalinde has a piece of paper, marked as shown, which she folds to form a cube. Which of the following five cubes can she get from this paper?

Rosalinde mempunyai sekeping kertas yang bercorak seperti berikut, yang dilipat olehnya untuk membentuk suatu kubus. Antara lima kubus berikut, yang manakah dia akan peroleh?

Rosalinde 有一张纸，如图所示，她要折成一个立方体。以下五个立方体，哪一个才是她用这张纸折出来的?



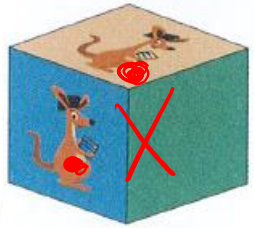


(A)

(B)

(C)

(D)



(E)

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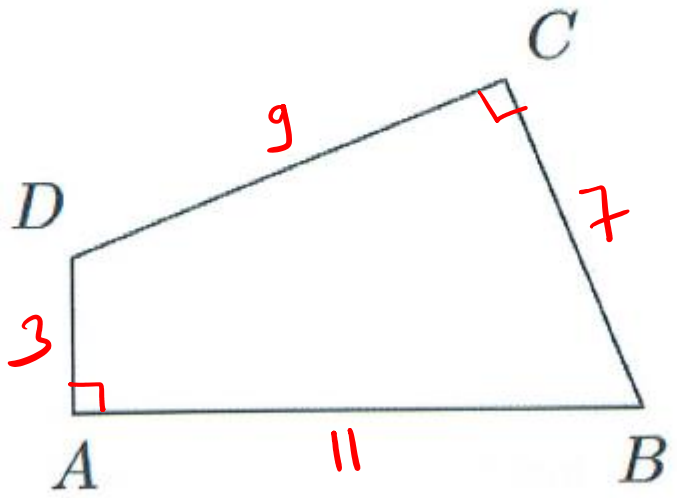
 # 5. The quadrilateral $ABCD$ has sides $AB = 11$, $BC = 7$, $CD = 9$ and $DA = 3$. It has right angles at A and C. What is the area of this quadrilateral?

Sisi empat $ABCD$ mempunyai sisi $AB = 11$, $BC = 7$, $CD = 9$ dan $DA = 3$. Ia mempunyai sudut tegak di A dan C. Berapakah luas sisi empat ini?

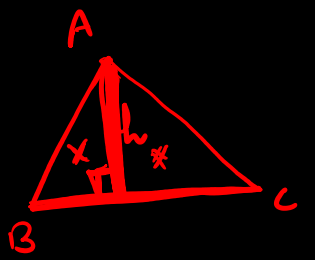
四边形 $ABCD$ 有边长 $AB = 11$，$BC = 7$，$CD = 9$ 和 $DA = 3$。A 和 C 皆为直角。此四边形的面积是多少?



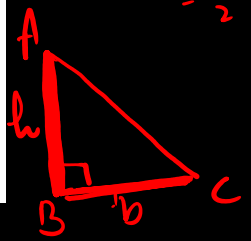
(A) 30 (B) 44 (C) 48 . (D) 52 (E) 60

right angle = 90°

Area of triangle = $\frac{1}{2}$ x base x height



Area of $\triangle ABC$ = $\frac{1}{2} \times BC \times h$



area $\triangle$ = $\frac{1}{2} \times h \times b$

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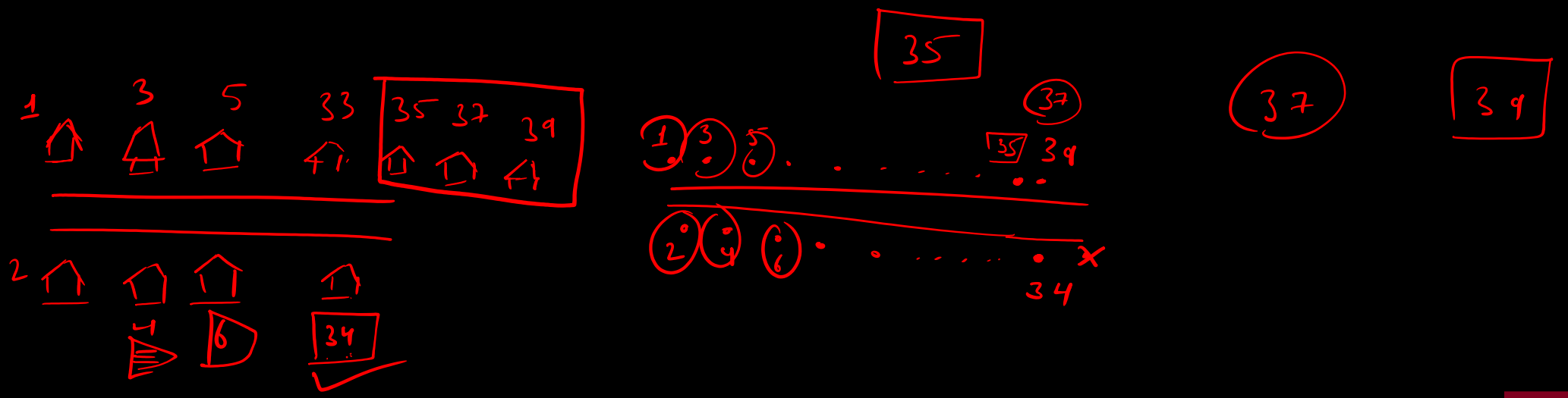
 # 6. On the left side of Main Street, one will find all odd house numbers from 1 to 39. On the right side, the house numbers are all even numbers from 2 to 34. How many houses are there on Main Street?

Di sebelah kiri Main Street, nombor rumahnya adalah semua nombor ganjil daripada 1 hingga 39. Di sebelah kanan, nombor rumahnya adalah semua nombor genap daripada 2 hingga 34. Berapakah bilangan rumah yang terdapat di Main Street?

在大街的左侧，一个人可以找到从 1 到 39 的所有奇数的门牌号。在右侧，门牌号都是从 2 到 34 的偶数。大街上一共有多少间房子?

(A) 8 (B) 36 (C) 37 (D) 38 (E) 73



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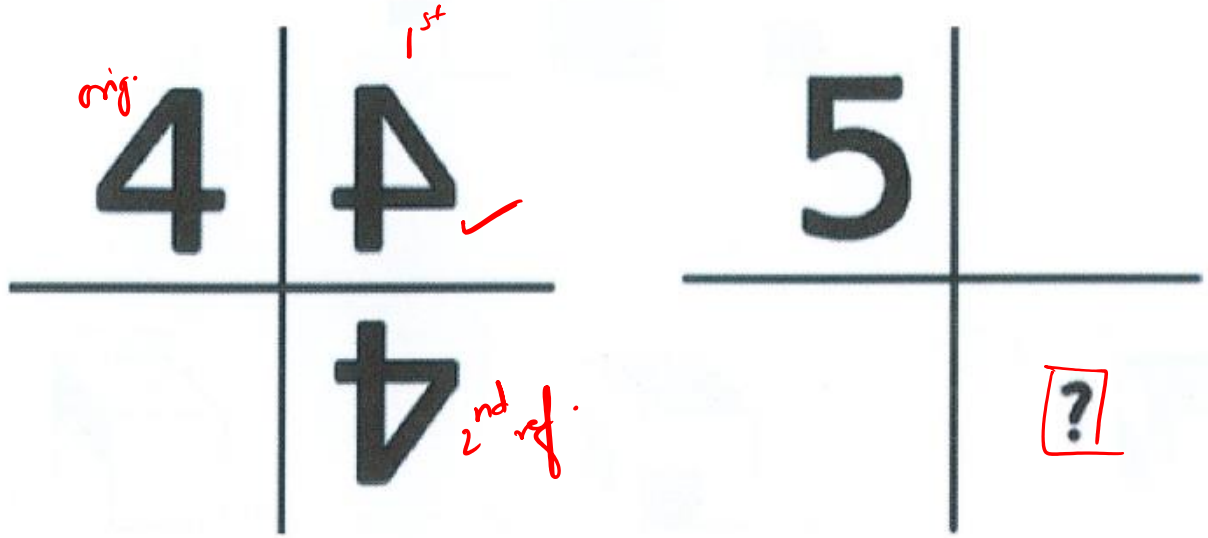
 # 7. The number 4 is next to two mirrors, so it reflects twice as shown. When the same thing happens to number 5, what do we get instead for the question mark?

Nombor 4 berada di sebelah dua cermin, maka berlaku pantulan dua kali seperti yang ditunjukkan. Apabila perkara yang sama dibuat kepada nombor 5, apakah yang akan kita lihat di kawasan bertanda soal?

数字 4 紧挨着两面镜子，它可以反射两次，如图所示。当同样的事情换成数字 5 时，我们从问号处能看到什么?



(A)

(B)

(C)

(D)

(E)

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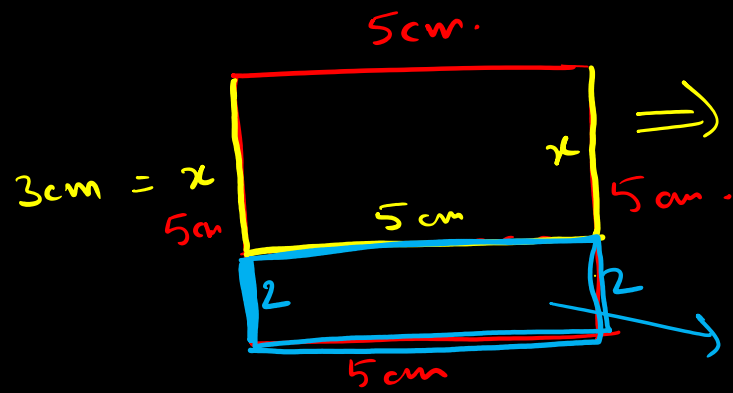
 # 8. Vanda cuts a paper in the shape of a square with a perimeter of 20 cm into two rectangles. The perimeter of one rectangle was 16 cm. What was the perimeter of the second rectangle?

Vanda memotong sekeping kertas berbentuk segi empat sama dengan perimeter 20 cm kepada dua segi empat tepat. Perimeter bagi salah satu segi empat tepat ialah 16 cm. Berapakah perimeter bagi segi empat tepat yang kedua?

Vanda 将一张周长为 20cm 的正方形纸剪成两个长方形。一个长方形的周长是 16cm。第二个长方形的周长是多少?

(A) 8 cm (B) 9 cm (C) 12 cm (D) ~~14~~ cm (E) 16 cm



Perimeter = 20cm.

$\Rightarrow$ Perimeter $= 10 + 2x = 16$

$x = 3$

Perimeter of 2nd rectangle $= 5 + 5 + 2 + 2$

$= 14$ cm

10

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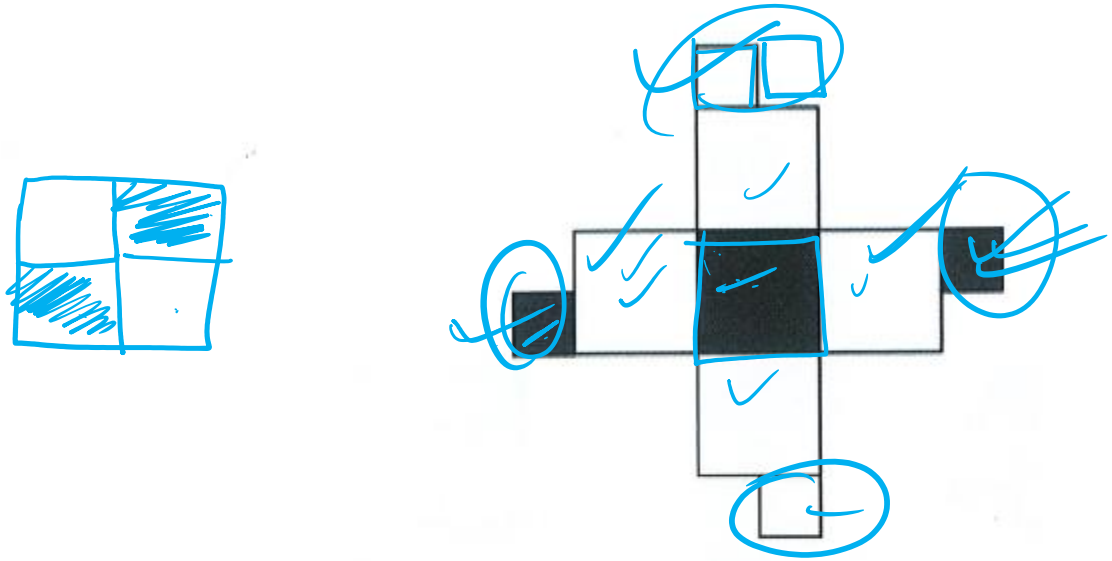
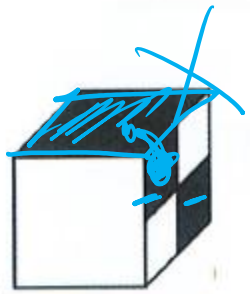
 # 9. If we fold up the net below, which of these cubes can we make?

Jika kita melipat bentangan di bawah, kiub yang manakah akan terhasil?

如果我们将下面的平面展开图折叠起来，我们可以得到哪一个立方体?



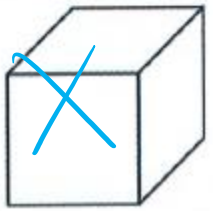
(A)



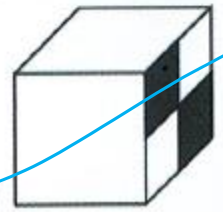
(B)

(C)

(D)



(E)



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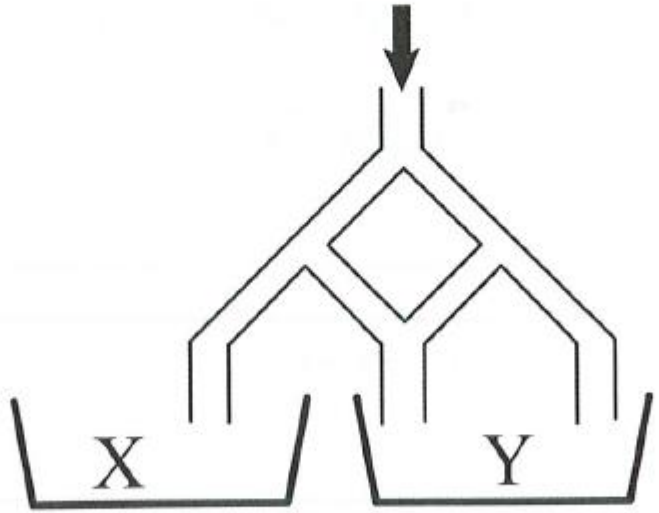
 # 10. We pour 1000 liters of water into the top of the pipework shown in the figure. Every time a pipe forks, the water splits into two equal parts. How many liters of water will reach container Y?

Kita tuangkan 1000 liter air ke dalam bahagian atas paip seperti yang ditunjukkan pada rajah berikut. Setiap kali paip bercabang, aliran air akan terbahagi kepada dua bahagian yang sama. Berapa literkah air yang akan sampai ke dalam bekas Y?

我们将 1000 公升的水倒入图中所示的管道顶部。每到一个分叉管，水量将分成两个相等的部分。那么到达容器 Y 的水量会是多少公升?



(A) 660 (B) 800 (C) 1200 (D) 750 (E) 500

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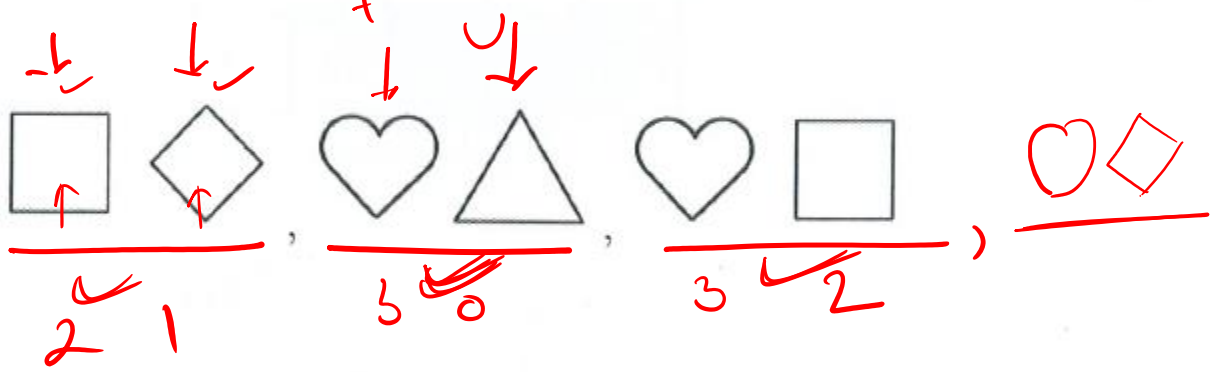
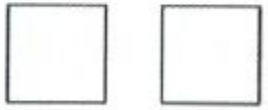
 # 11. Francesca wrote down three consecutive 2-digit numbers in their natural order, but instead of the digits she used symbols below. Which number is next?

Francesca menulis tiga nombor 2 digit yang berturutan mengikut susunan sebenar mereka, tetapi dia menggunakan simbol dan bukannya menggunakan digit. Apakah nombor yang seterusnya?

Francesca 按照自然数顺序写下了三个连续的两位数，她使用以下的符号来代表每个数字。接下来是哪个数?

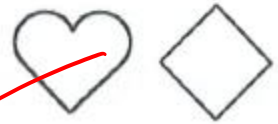


(A)

(B) 

(C)

(D)

(E) 

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 # 12. Maria, Peter, Richard and Tina were playing football in the classroom and one of them broke a window. When the principal asked who did it, she got the following responses: Maria: "It was Peter". Peter: "It was Richard". Richard: "It wasn't me". Tina: "It wasn't me". Only one child was telling the truth. Who broke the window?

Maria, Peter, Richard dan Tina bermain bola sepak di dalam kelas dan salah seorang daripada mereka telah memecahkan tingkap kelas itu. Apabila guru besar bertanya siapa yang melakukannya, dia mendapat jawapan berikut: Maria: "Peter yang buat". Peter: "Richard yang buat". Richard: "Bukan saya yang buat". Tina: "Bukan saya yang buat". Hanya seorang sahaja yang bercakap benar. Siapakah yang memecahkan tingkap itu?

Maria,Peter,Richard 和 Tina 在课室里面踢足球，结果其中一个人不小心打破窗口了。当校长询问是谁干的时候，她得到以下的答复：Maria："是 Peter"。Peter："是 Richard"。Richard："不是我"。Tina："不是我"。只有一个孩子说真话。是谁打破窗口呢?

(**A**) Maria
(**B**) Tina
(**C**) Peter
(**D**) Richard
(**E**) Cannot be determined / *Tidak dapat ditentukan* / 无法确定

Maria : It was peter
Peter : It was Richard
Richard : It wasn't me.
Tina : It wasn't me.

Contradiction method

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 # 13. Lonneke wants the sum of the numbers in the white cells to equal the sum of the numbers in the grey cells. Which two numbers does she need to swap?

Lonneke mahukan hasil tambah nombor-nombor dalam petak putih sama dengan hasil tambah nombor-nombor dalam petak kelabu. Apakah dua nombor yang perlu saling ditukar?

Lonneke 想要白色格子中的数字总和等于灰色格子中的数字总和。她需要交换哪两个数字?

1	3	5	2	13
7	4	6	8	11

(A) 1 & 11 **(B)** 2 & 8 **(C)** 3 & 7 **(D)** 4 & 13 **(E)** 7 & 13

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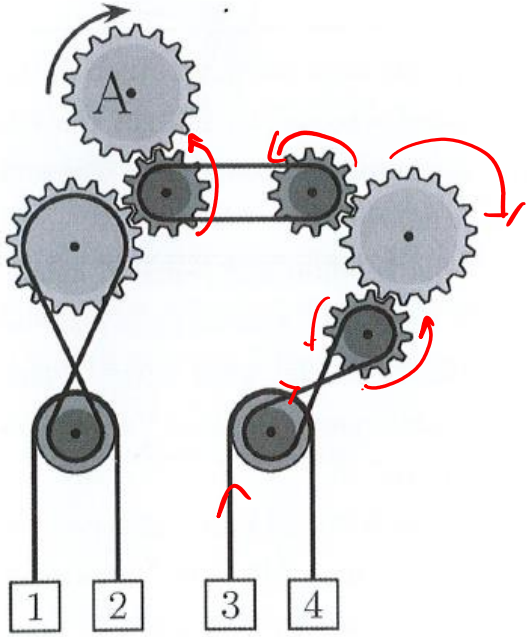
 # 14. The gear marked A is turned clockwise, as shown. Which two boxes will move upwards?

Gear bertanda A dipusingkan mengikut arah jam, seperti yang ditunjukkan. Dua kotak manakah akan bergerak ke atas?

如图所示，标有 A 记号的齿轮按顺时针转动。哪两个箱子会往上移动?



(**A**) 1 & 4

(**B**) 2 & 3 ✓

(**C**) 1 & 3

(**D**) 2 & 4

(**E**) Cannot be determined / *Tidak boleh ditentukan* / 无法确定

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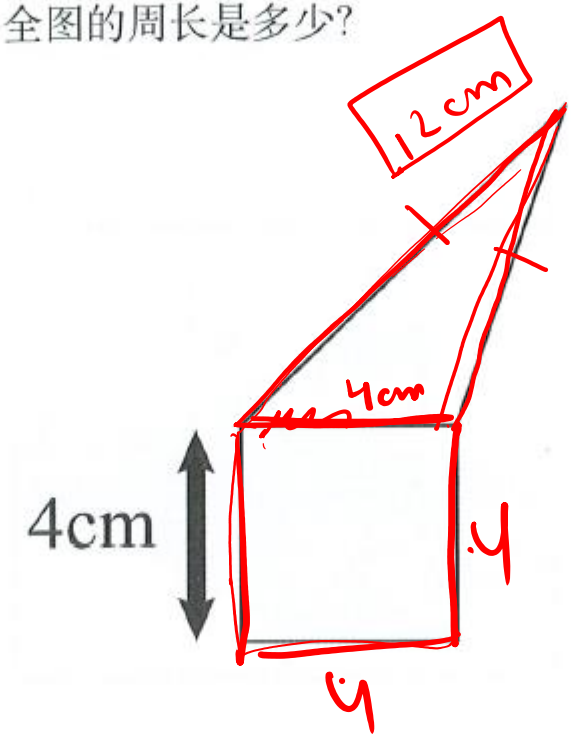
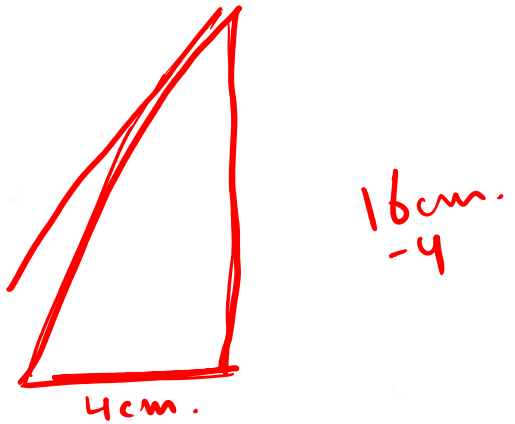
 # 19. The triangle and the square have the same perimeter. What is the perimeter of the whole figure?

Segi tiga dan segi empat sama berikut mempunyai perimeter yang sama. Berapakah perimeter bagi seluruh rajah tersebut?

三角形和正方形的周长相同。全图的周长是多少?





16cm.

(A) 12 cm (B) 24 cm (C) 28 cm (D) 32 cm (E) 36 cm

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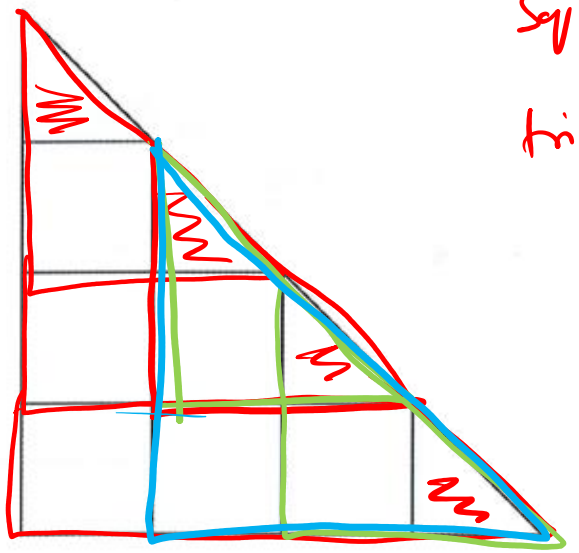
 # 18. If you count the number of all possible triangles and the number of all possible squares in the figure, how many more triangles than squares do you find?

Jika anda mengira bilangan semua segi tiga yang mungkin dan bilangan semua segi empat sama yang mungkin dalam rajah berikut, berapakah beza bilangan segi tiga dengan bilangan segi empat sama yang anda dapati?

如果你从图中数一数所有可能的三角形的数量和所有可能的正方形的数量，你找到的三角形比正方形多多少个?



Sq = 7

Tri = 7 + 1 + 1 + 1 = 10

(A) 1 (B) 2 (C) 3 (D) 4 (E) 0

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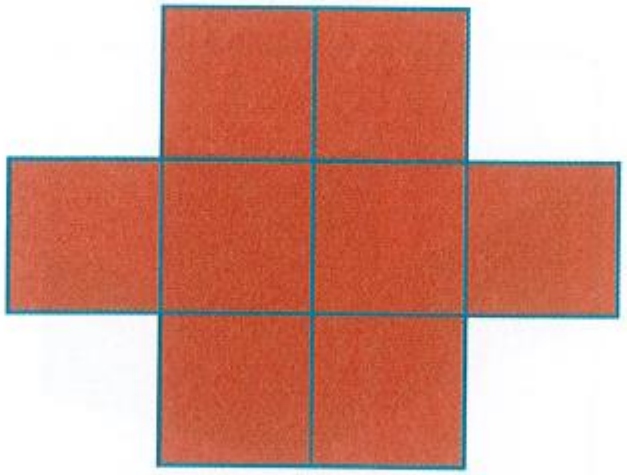
 # 15. The perimeter of the figure below, built up of identical squares, is equal to 42 cm. What is the area of the figure?

Rajah di bawah mempunyai perimeter 42 cm dan terbina daripada beberapa segi empat sama yang serupa. Berapakah luas rajah tersebut?

下图由几个相同的正方形合成，其周长等于 42 cm。此图形的面积是多少?



(A) 8 cm^2 (B) 9 cm^2 (C) 24 cm^2 (D) 72 cm^2 (E) 128 cm^2

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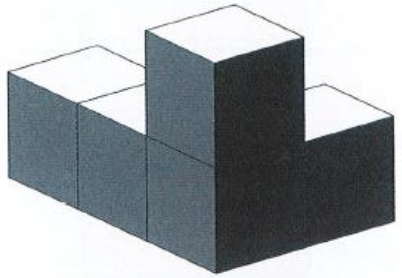
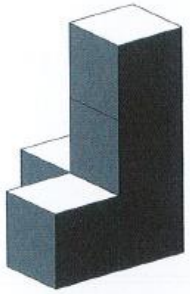
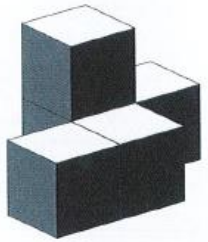
 # 16. Each block from the given answers consists of exactly 5 cubes. Which block cannot be obtained from the block below by moving exactly one cube?



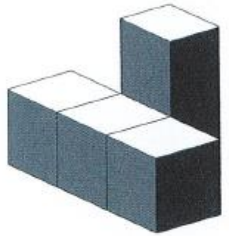
(A)



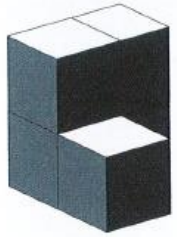
(B)



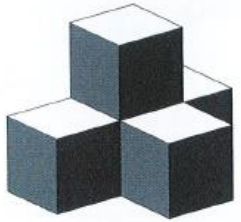
(C)



(D)



(E)



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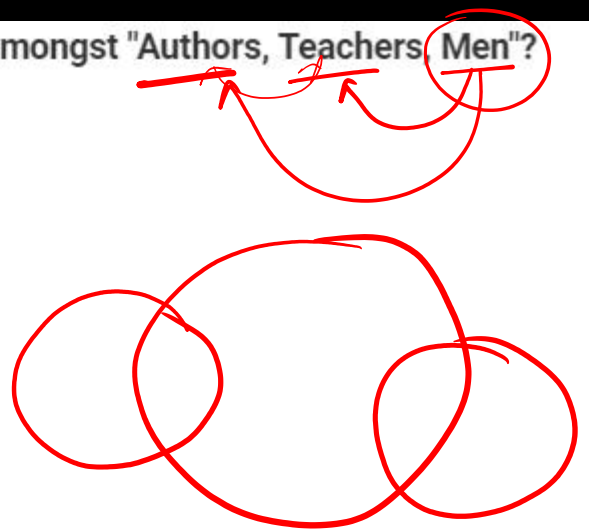
Which of the following options best depicts the relationship amongst "Authors, Teachers, Men"?

A)

B)

C)

D)



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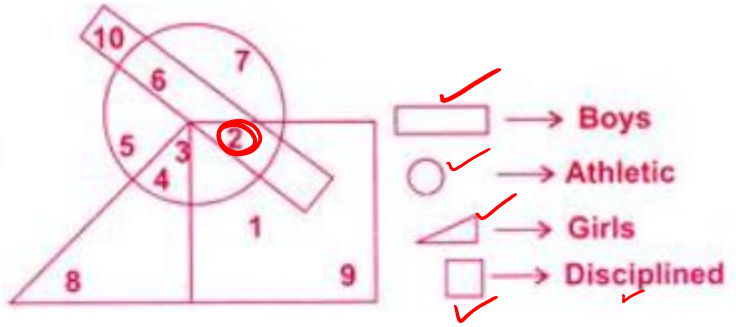
In the given diagram, the boys who are athletic and disciplined are indicated by which number?



A)
1

B)
2

C)
10

D)
6

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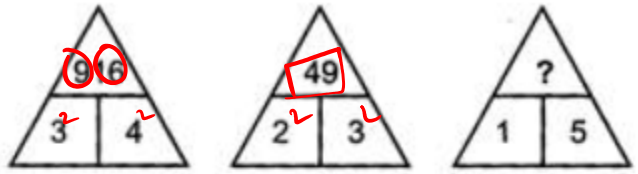
Find the missing number.



A)

○ 125

B)

○ 215

C)

○ 251

D)

○ 512

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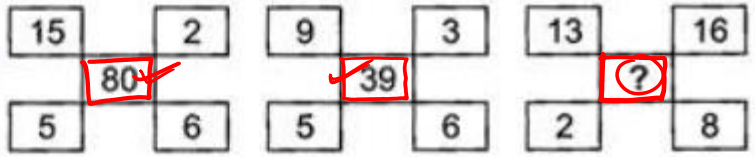
Find the missing number.



A)
○ 35

B)
○ 48

C)
○ 72

D)
○ 120

15 × 6 = 90
5 × 2 = 10
80

54
15
69

54
−15
39

13 × 8 = 104
16 × 2 = −32

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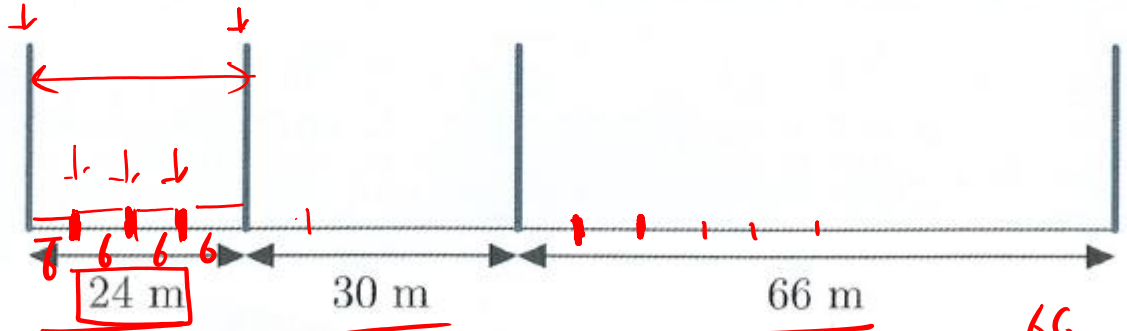
 # 24. Four poles are placed along a 120 m track, as shown. What is the smallest number of poles that should be added so that the track is divided into sections of equal length?

Empat tiang diletakkan di sepanjang trek berukuran 120 m, seperti yang ditunjukkan pada gambar berikut. Berapakah bilangan tiang paling sedikit yang perlu ditambahkan kepada trek tersebut supaya trek tersebut terbahagi kepada bahagian-bahagian yang sama panjang?

如图所示，四根杆子沿着 120 米的轨道放置。最少要增加多少根杆子才能将轨道分成等长的部分？



(A) 12 (B) 15 (C) 17 (D) 20 (E) 37

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 # 23. Ann calculated the sum of the greatest and the least two-digit multiples of three. Bob calculated the sum of the greatest and the least two-digit numbers that are not multiples of three. How greater is Ann's number compared to Bob's number?

Ann mengira hasil tambah nombor dua digit yang merupakan gandaan tiga yang paling besar dan yang paling kecil. Bob mengira hasil tambah nombor dua digit yang bukan gandaan tiga yang paling besar dan yang paling kecil. Berapakah beza nombor Ann berbanding nombor Bob?

Ann 把三的倍数的最大两位数和最小两位数相加。Bob 把不是三的倍数的最大两位数和最小两位数相加。Ann 的总数比 Bob 的总数大多少?

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

Ann => 12 + 99 = 111

Bob => 10 + 98 = 108

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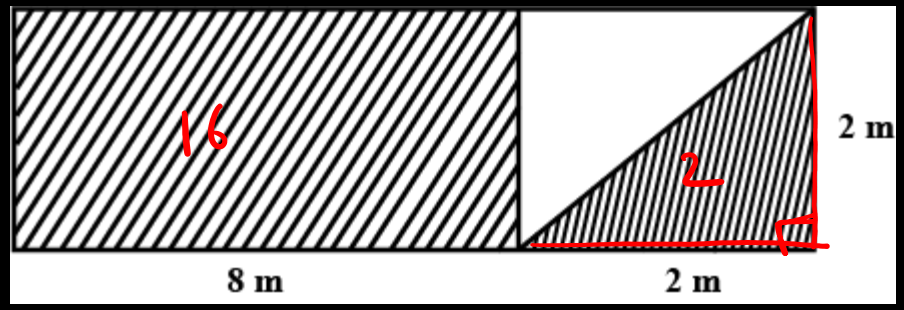
The area (in m^2)of the shaded part in the figure given below is:

a) 16

b) 18

c) 14

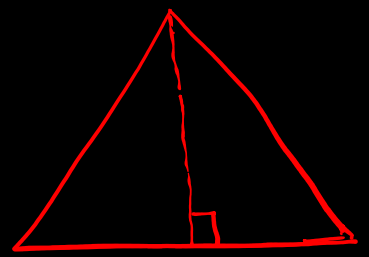
d) 20



Area of triangle

$= \frac{1}{2} \times$ base $\times$ height

$=$



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A number is doubled, and half of the number is added to it. If 10 is subtracted from the result, then we get a number which is one less than the original number. The original number is:

a) 5
b) 6
c) 7
d) 8

no. is x

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