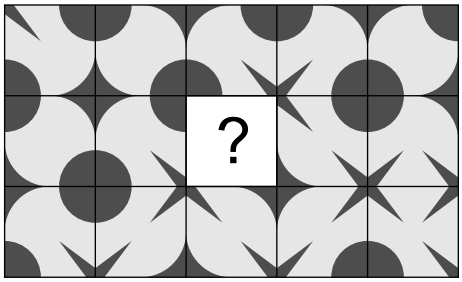
3 points

 # 1. Which piece completes the pattern?

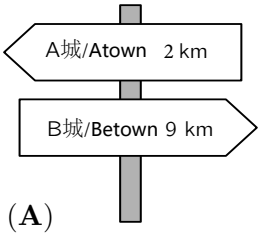
以下哪一块拼图能够拼成完整的图案?

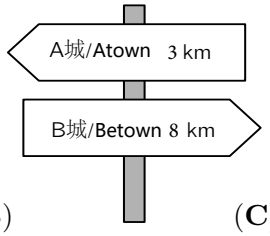


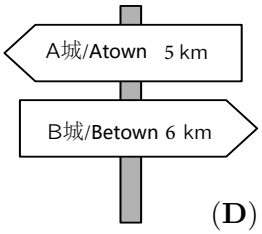
(A)  (B)  (C)  (D)  (E) 

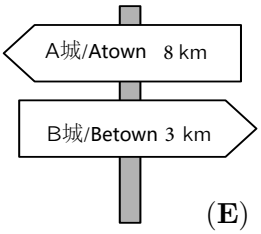
 # 2. As Amira is walking from Atown to Betown she passes the five signposts shown. Which one of the signposts is incorrect?

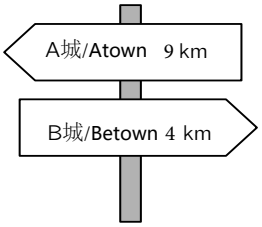
当小艾从A城步行到B城时，她会经过五个路标。哪一个路标是错的?

(A) 

(B) 

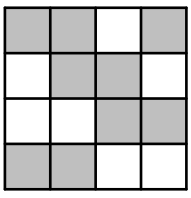
(C) 

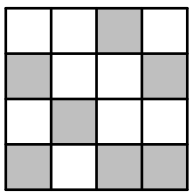
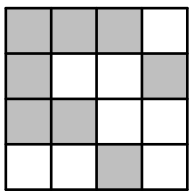
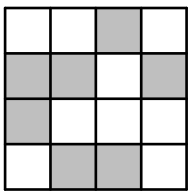
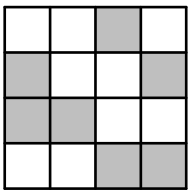
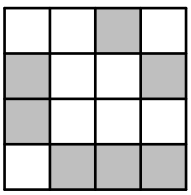
(D) 

(E) 

 # 3. A large square is made up of smaller white and grey squares. What does the large square look like if the colours of the white and grey squares are interchanged?

一个大正方形是由一些较小的白色和灰色正方形所组成。如果将白色和灰色正方形的颜色互换，那么大正方形会变成什么样子?



(A)  (B)  (C)  (D)  (E) 

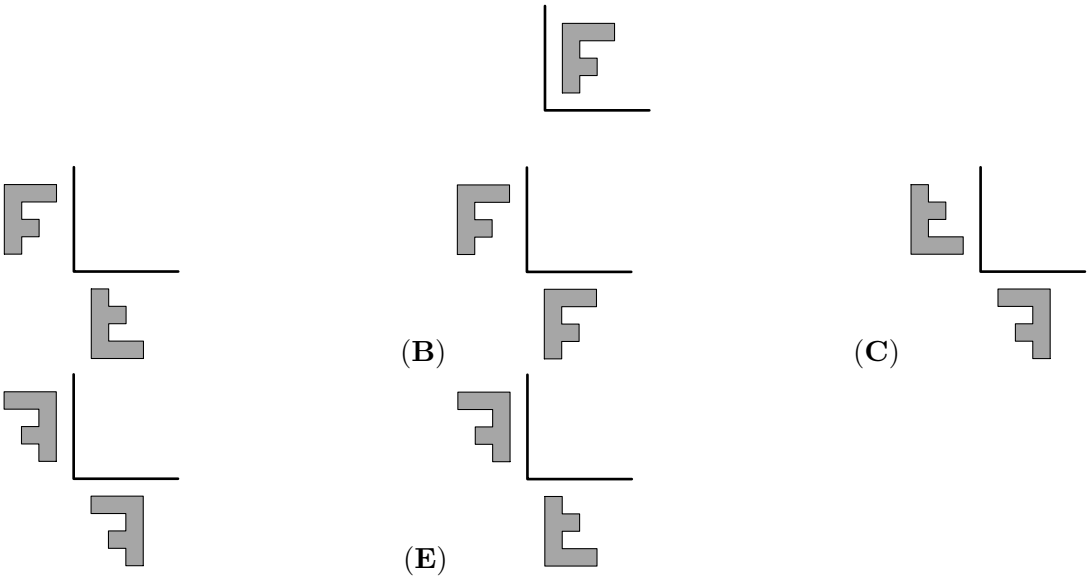
 # 4. Mikas wants to bake 24 muffins for his birthday party. To bake six muffins two eggs are needed. Eggs are sold in boxes of six. How many boxes does Mikas need to buy?

小米想为自己的生日聚会烘焙24个松饼。每六个松饼需要两个鸡蛋。鸡蛋是以每盒六个的方式出售。那么，小米需要买几盒鸡蛋?

(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 8

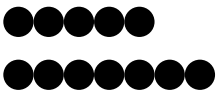
 # 5. Flora reflects the letter F on the two lines shown. What will the reflections look like?

小芳让字母F沿着两条线做对称，经过对称变换后的字母F会是什么样子?



 # 6. Kim has several chains of length 5 and of length 7. By joining chains one after the other, Kim can create different lengths. Which of these lengths is impossible to make?

小凯有若干条长度分别为5和7的链子。通过把链子连接在一起，小凯可以制作不同长度的链子。以下哪一个长度的链子是不可能制作出来的?



(**A**) 10 (**B**) 12 (**C**) 13 (**D**) 14 (**E**) 15

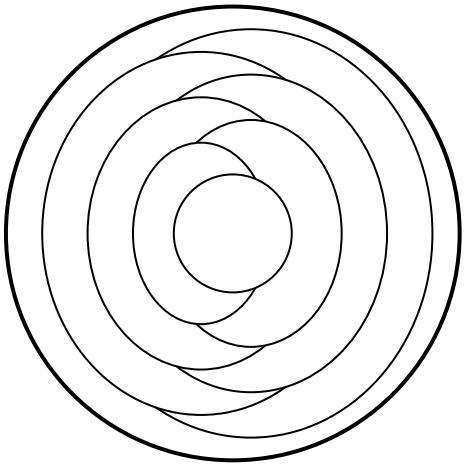
 # 7. Maria has 10 sheets of paper. She cuts some of the sheets into five parts each. After that, Maria has 22 pieces in total. How many sheets did she cut?

小莫有10张纸。她剪了一些纸且把每一张剪成了五个部分。剪完之后，一共有22张纸。那么，她剪了几张纸?

(**A**) 3 (**B**) 2 (**C**) 6 (**D**) 7 (**E**) 8

 # 8. Cindy colours each region of the pattern below either red, blue or yellow. She colours regions that touch each other with different colours. She colours the outer region blue. How many regions of the completed pattern are coloured blue?

小新将以下图案的每个区域分别涂上红色，蓝色或黄色。她将相邻的区域涂上不同的颜色。首先，她将最外面的区域涂上蓝色。请问涂完色的图案中有多少个区域被涂上蓝色?



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

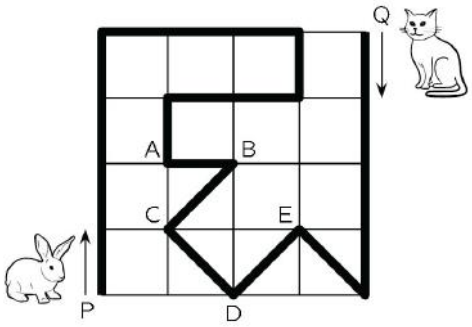
 # 9. Four baskets contain 1, 4, 6 and 9 apples respectively. How many apples should be moved between the baskets to have the same number of apples in each basket?

四个篮子分别装有1、4、6和9个苹果。请问四个篮子之间应该移动多少个苹果，使得每个篮子中的苹果数量相同?

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

 # 10. A rabbit and a cat walk in the park along the path marked by the thick black line. The rabbit starts from P at the same time as the cat starts from Q. The rabbit walks three times as fast as the cat. At which point do they meet?

一只兔子和一只猫在公园里沿着黑色粗线标记的路径行走。兔子从P开始行走而猫也同时从Q开始行走。兔子的行走速度是猫的三倍。他们会在哪个点相遇?



(**A**) A (**B**) B (**C**) C (**D**) D (**E**) E

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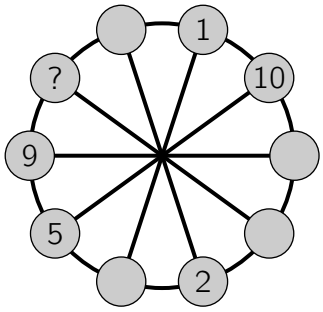
4 points

 # 11. The numbers from 1 to 10 have to be placed in the small circles, one in each circle. Numbers in any two neighbouring circles must have the same sum as the numbers in the two diametrically opposite circles. Some of the numbers are already placed. What number should be placed in the circle with the question mark?

将数字从1到10写在圆里，每个圆中写一个数字。任何两个相邻圆中的数字之和必须与这两个相对的圆中的数字之和相同。一些圆中已经写好一些数字，请问带问号的圆里应该是什么数字?



(**A**) 3 (**B**) 4 (**C**) 6 (**D**) 7 (**E**) 8

 # 12. When Elise the bat leaves her cave, a digital clock shows 20:20
When she returns and is hanging upside down, she sees 20:20 on the clock again.
How long has she been away from her cave?

当蝙蝠小艾离开洞穴时，数字时钟显示 20:20 。当它返回并倒挂着时，它再次在时钟上看到 20:20 ，请问它离开山洞多久了?

(**A**) 3 : 28 (**B**) 3 : 40 (**C**) 3 : 42 (**D**) 4 : 18 (**E**) 5 : 42

 # 13. An elf and a troll meet. The troll always lies, while the elf always tells the truth. They both say exactly one of the following sentences: which one?

一个精灵和一个恶魔相遇了。恶魔总是说假话，而精灵总是说真话。请问以下哪个句子是他俩都会说的?

(**A**) I am telling the truth
我在说真话

(**B**) You are telling the truth
你在说真话

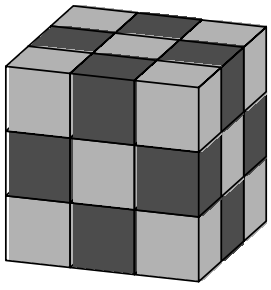
(**C**) We both are telling the truth
我们两个人都说真话

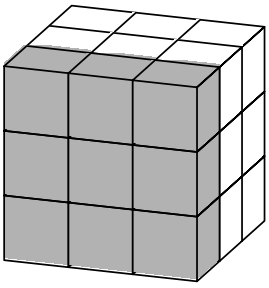
(**D**) I always lie
我总是说假话

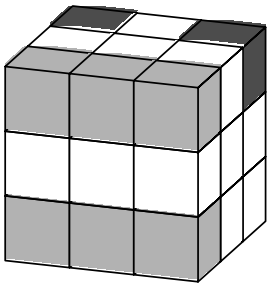
(**E**) One and only one of us is telling the truth
我们中有且只有一个人说真话

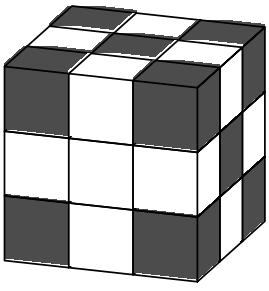
 # 14. Mary has exactly 10 white cubes, 9 light grey cubes and 8 dark grey cubes, all of the same size. She glues all these cubes together to build a big cube. One of the cubes below is the one she builds. Which one is it?

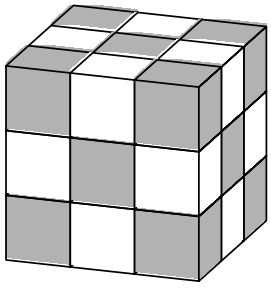
小丽有10个白色正方体，9个浅灰色正方体和8个深灰色正方体，它们的大小都相同。她将所有的正方体粘在一起组成一个大的正方体。请问下图哪一个大正方体是小丽的作品?

(**A**) 

(**B**) 

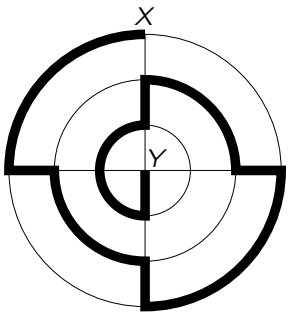
(**C**) 

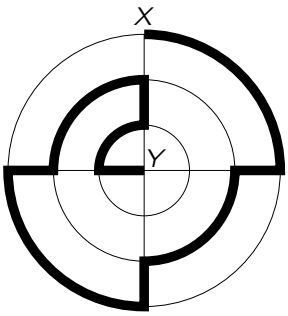
(**D**) 

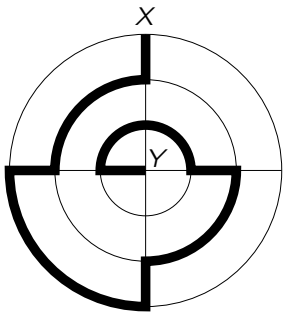
(**E**) 

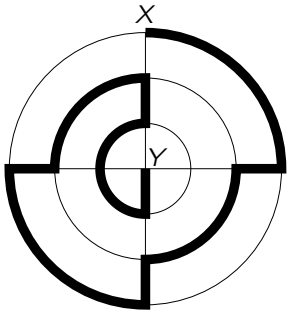
 # 15. The diagrams show five paths from X to Y marked with a thick line. Which path is the shortest?

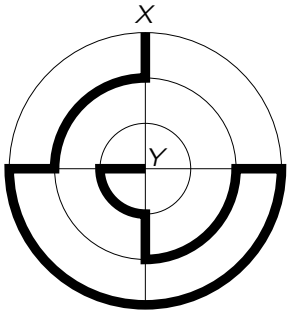
以下的选项显示了用粗线标记的从X到Y的五条路径。哪一条路径最短?

(**A**) 

(**B**) 

(**C**) 

(**D**) 

(**E**) 

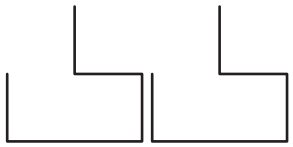
 # 16. A father kangaroo lives with his three children. They make all decisions by voting, and each member of the family gets as many votes as its age. The father is aged 36 and the children are 13, 6 and 4 years old, so the father always wins. How many years will it take for the children to win all votes, if they all agree?

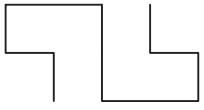
袋鼠爸爸和他的三个孩子住在一起。他们通过投票决定所有事项，每个家庭成员的票数与年龄相同。爸爸36岁，孩子分别13、6和4岁，因此父亲总是赢。如果孩子们全都同意某一件事，他们要过多少年才能赢?

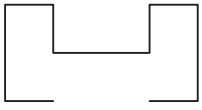
(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 13 (**E**) 14

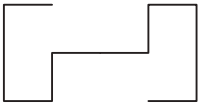
 # 17. Giorgio has two equal pieces of wire. Which of the following shapes cannot be obtained by putting together these two pieces?

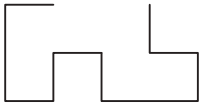
小格有两根相同的金属丝。如果组合这两根金属丝，请问无法得到以下哪种形状?

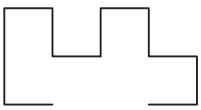


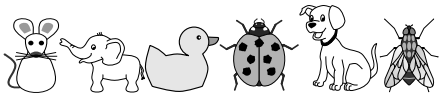
(**A**) 

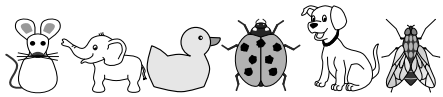
(**B**) 

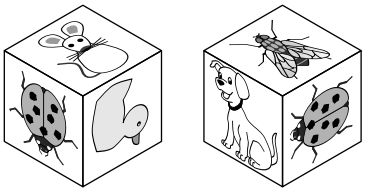
(**C**) 

(**D**) 

(**E**) 

 # 18. Amy glues the six stickers shown onto the faces of a cube: 
The pictures below show the cube in two different positions. Which sticker is on the face opposite the face with the mouse on?

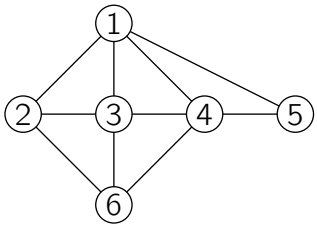
小爱把这六张贴纸粘在立方体的表面: 
下面的图片显示了该立方体在两个不同位置的情况。请问在老鼠贴纸对面是什么贴纸?



(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

 # 19. The diagram below shows the friendships of six girls: Ann, Beatrice, Chloe, Diana, Elisabeth and Fiona. Each number represents one of the girls and each line joining two numbers represents a friendship between those two girls. Chloe, Diana and Fiona each have four friends. Beatrice is friends with only Chloe and Diana. Which number represents Fiona?

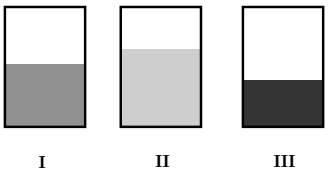
下图显示了六个女孩 A，B，C，D，E和F的友谊。每个数字代表一个女孩，线条则代表两个女孩之间的友谊。C，D和F分别有四个朋友。B只和C还有D是朋友。请问哪个数字代表F?

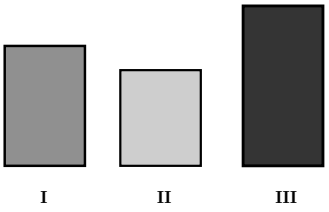


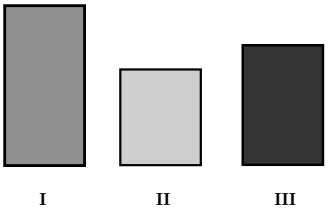
(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 6

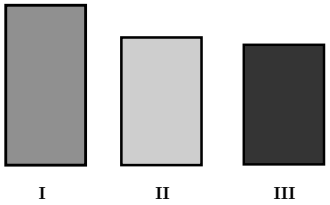
 # 20. Mary put the same amount of liquid in three rectangular vessels. Viewed from the front, they seem to have the same size, but the liquid has risen to different levels in the three vessels. Which of the following represents the three vessels when viewed from above?

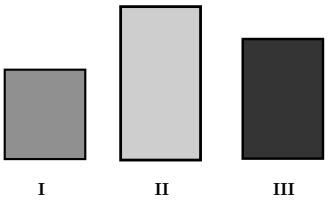
小梅将相同量的液体倒入三个矩形容器中。从正面看，它们的大小似乎相同，可是，三个容器中的液体高度不同。因此，从正上方观看时，以下哪个图像代表这三个容器?

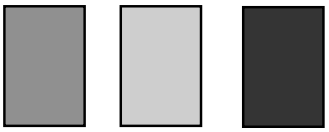


(A) 

(B) 

(C) 

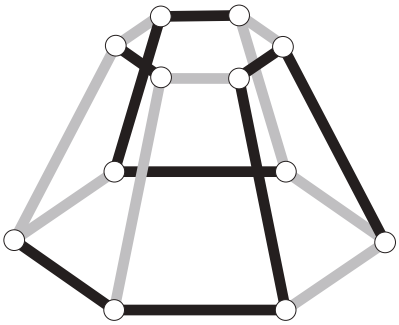
(D) 

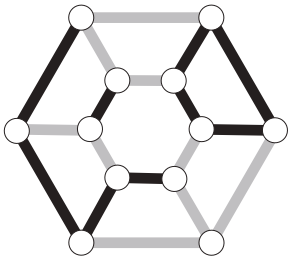
(E) 

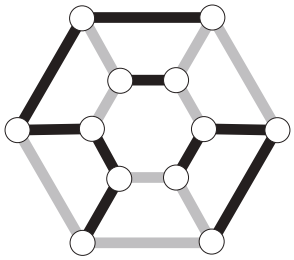
5 points

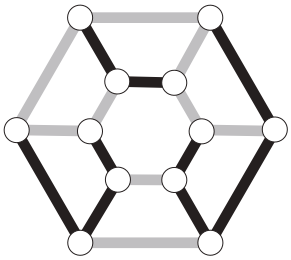
 # 21. What does the object look like when viewed from above?

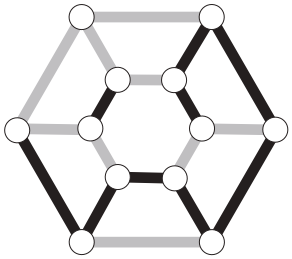
请问哪一个是从上方观看时所看到的视图?

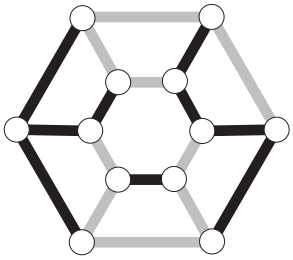


(**A**) 

(**B**) 

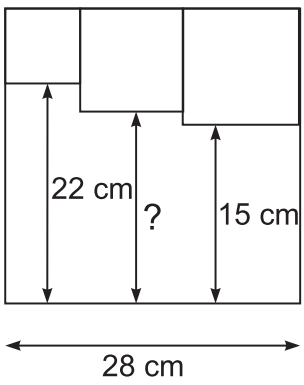
(**C**) 

(**D**) 

(**E**) 

 # 22. Three small squares are drawn inside a larger square as shown. What is the length of the line marked with a question mark?

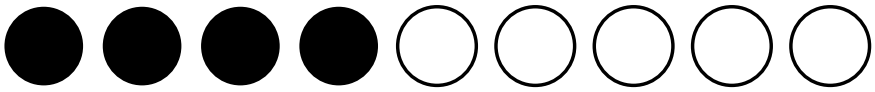
如图所示，在一个较大的正方形内绘制了三个小正方形。请问标有问号的那条线的长度是多少?



(**A**) 17 cm (**B**) 17.5 cm (**C**) 18 cm (**D**) 18.5 cm (**E**) 19 cm

 # 23. Nine tokens are black on one side and white on the other. Initially, four tokens have the black side upwards. In each turn you have to flip three tokens. What is the least number of turns you need to have all tokens showing the same colour?

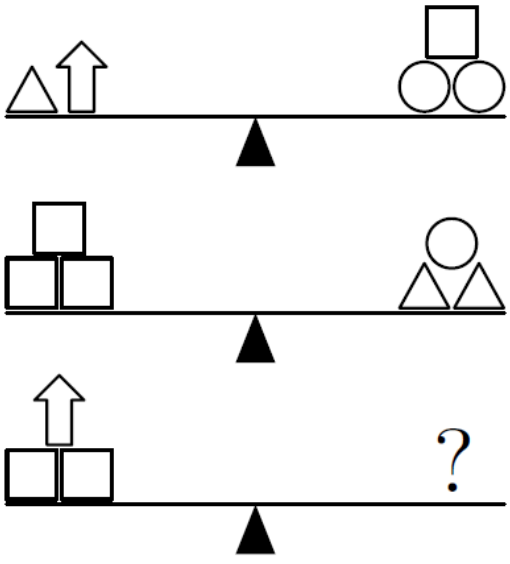
有九个硬币，其中一面为黑色，另一面为白色。起初，有四个硬币的黑色面朝上。每次你必须翻转三个硬币，请问至少需要多少次才能把所有硬币翻转成一样的颜色?



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

 # 24. Which of the following options will balance the third scale?

以下哪一个选项的物体能平衡第三个天秤?



(**A**) 

(**B**) 

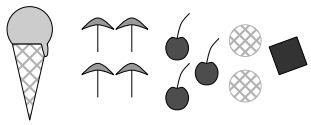
(**C**) 

(**D**) 

(**E**) 

 # 25. Ten people each order one scoop of ice cream. They order 4 scoops of vanilla, 3 scoops of chocolate, 2 scoops of lemon and 1 scoop of mango. They top the ice creams with 4 umbrellas, 3 cherries, 2 wafers and 1 chocolate chip. They use one topping on each scoop, such that no two ice creams are alike. Which of the following combinations is NOT possible.

十个人每人点一勺冰淇淋。他们点了4勺香草冰淇淋，3勺巧克力冰淇淋，2勺柠檬冰淇淋和1勺芒果冰淇淋。他们将4把小雨伞、3个樱桃、2个华夫饼和1个巧克力碎片分别放到这些冰淇淋上，他们在每勺冰淇淋上都只放一种配料，这样就没有任何两种冰淇淋是一样的了。请问下列哪一种组合是不可能的。



(**A**) chocolate with a cherry
巧克力冰淇淋和一个樱桃

(**B**) mango with an umbrella
芒果冰淇淋和一把小雨伞

(**C**) vanilla with an umbrella
香草冰淇淋和一把小雨伞

(**D**) lemon with a wafer
柠檬冰淇淋和一个华夫饼

(**E**) vanilla with a chocolate chip
香草冰淇淋和一个巧克力碎片

 # 26. We call a 3-digit number *nice* if its middle digit is greater than the sum of its first and last digits. What is the largest possible number of consecutive *nice* 3-digit numbers?

如果一个3位数的中间数大于它的第一个和最后一个数字之和，我们称它为“完美”数。请问最多有多少个连续的三位数是“完美”数?

(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 8 (**E**) 9

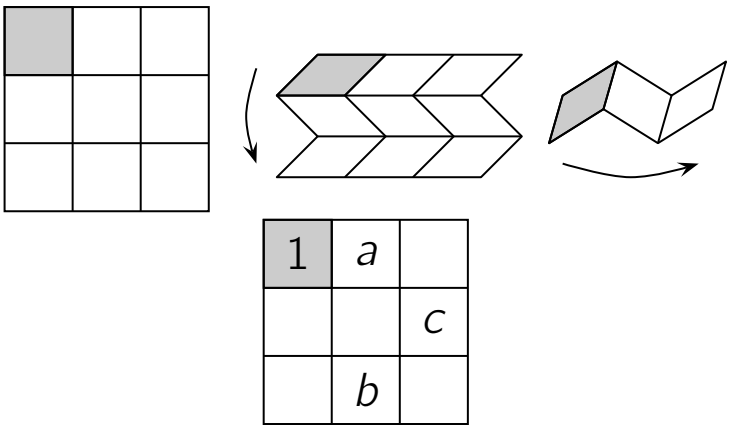
 # 27. Magnus has to play 15 games in a chess tournament. At some point during the tournament he has won half of the games he has played, he has lost one third of the games he has played and two have ended in a draw. How many games does Magnus still have to play?

小马必须在象棋比赛中完成15场比赛。在比赛的某个时刻，他获胜的局数是参与过的比赛的一半，他失败的局数是参与过的比赛的三分之一，而有两场比赛都以平局结束。小马还剩多少场比赛没完成?

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

 # 28. Vadim has a square piece of paper divided into nine cells. He folds the paper as shown: overlapping horizontally, and then vertically so that the grey square ends on top. Vadim wants to write the numbers from 1 to 9 into the cells so that, once the paper is folded, the numbers would be in increasing order with number 1 on the top layer. What numbers should he write instead of a, b and c?

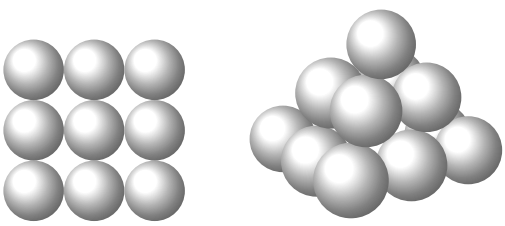
小薇有一张正方形的纸，分为九个小方格。如图所示，他先把纸张横着折，然后再竖着折，使得灰色格子处于顶端。小薇想要将1到9的数字写到小方格中，使得折叠纸张后，数字能从上到下按顺序排列，并且数字1将在顶端。请问他应该在a、b和c那里填上什么数字?



(**A**) $a = 6$, $b = 4$, $c = 8$ (**B**) $a = 4$, $b = 6$, $c = 8$ (**C**) $a = 5$, $b = 7$, $c = 9$
(**D**) $a = 4$, $b = 5$, $c = 7$ (**E**) $a = 6$, $b = 4$, $c = 7$

 # 29. Don builds a pyramid with balls. The square base consists of 3×3 balls as shown on the left. The right diagram shows the middle layer that has 2×2 balls, and there is one ball at the top. He puts glue at each contact point between two balls. How many glue points are there?

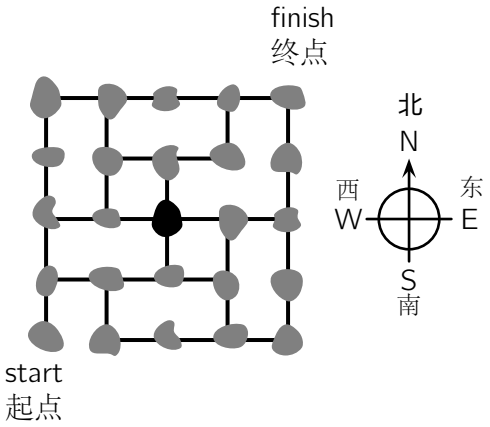
多多用了一些球体组合成一个金字塔。如左图所示，正方形底部是由3×3的球体组成。右图显示的中间层由2×2的球体组成，并且顶部只有一个球体。每两个球之间的接触点都会涂上胶水。请问这个金字塔一共有多少个胶合点?



(**A**) 20 (**B**) 24 (**C**) 28 (**D**) 32 (**E**) 36

 # 30. The figure shows a map of some islands and how they are connected by bridges. A postman has to visit each island exactly once. He starts on the island marked "start" and would like to finish on the island marked "finish". He has just reached the black island in the centre of the map. In which direction should he move to be able to complete his route?

下图显示的是一些岛屿以及桥梁连接道路的地图。一个邮递员必须要经过每个岛，且每个岛只经过一次，他从标记为“起点”的岛开始，并且在标记为“终点”的岛结束。他刚到达地图中心的黑色岛屿，请问他应该朝哪个方向前进才能完成路线?



(**A**) by going North 向北走
(**B**) by going East 向东走
(**C**) by going South 向南走
(**D**) by going West 向西走
(**E**) there is no such path as the postman wishes to follow 没有邮递员想走的路

END OF PAPER

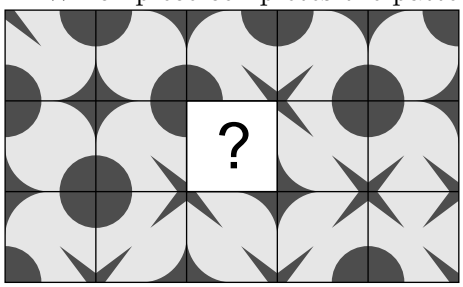
-Scratch Paper-
草稿纸

-Scratch Paper-

草稿纸

3 points

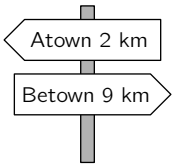
 # 1. Which piece completes the pattern?



(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

Solution:

 # 2. As Amira is walking from Atown to Betown she passes the five signposts shown. One of them is incorrect. Which one?

(**A**) 

(**B**) 

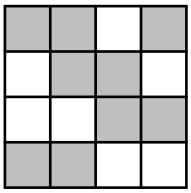
(**C**) 

(**D**) 

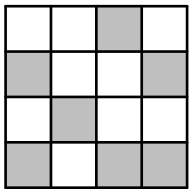
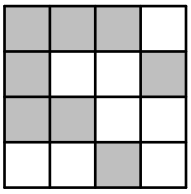
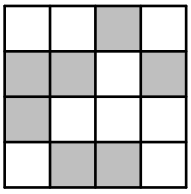
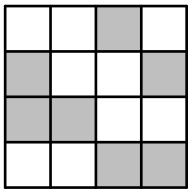
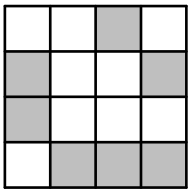
(**E**) 

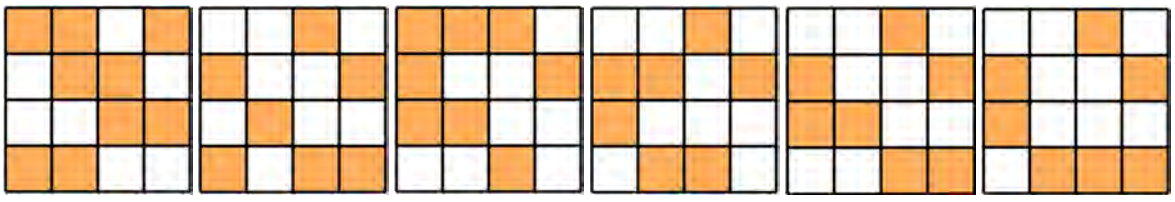
Solution:

 # 3. A large square is made up of smaller white and grey squares.



What does the large square look like if the colours of the white and grey squares are interchanged?

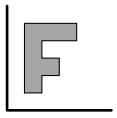
(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

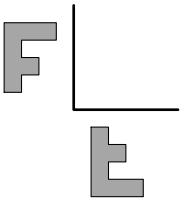
Solution: 

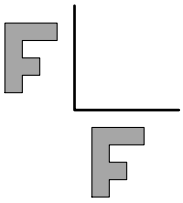
 # 4. Mikas wants to bake 24 muffins for his birthday party. To bake six muffins two eggs are needed. Eggs are sold in boxes of six. How many boxes does Mikas need to buy?

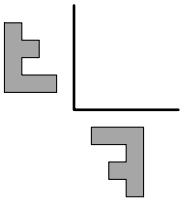
(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 8

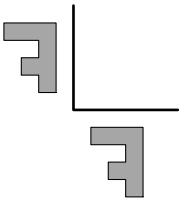
Solution:

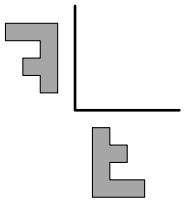
 # 5. Flora reflects the letter F in the two lines shown.  What will the reflections look like?

(**A**) 

(**B**) 

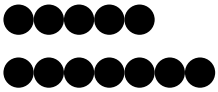
(**C**) 

(**D**) 

(**E**) 

Solution:

 # 6. Kim has several chains of length 5 and of length 7.



By joining chains one after the other, Kim can create different lengths.
Which of these lengths is impossible to make?

(**A**) 10 (**B**) 12 (**C**) 13 (**D**) 14 (**E**) 15

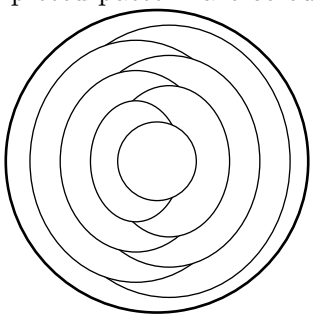
Solution:

 # 7. Maria has 10 sheets of paper. She cuts some of the sheets into five parts each. After that Maria has 22 pieces in total. How many sheets did she cut?

(**A**) 3 (**B**) 2 (**C**) 6 (**D**) 7 (**E**) 8

Solution:

 # 8. Cindy colours each region of the pattern below either red, blue or yellow. She colours regions that touch each other different colours. She colours the outer region blue. How many regions of the completed pattern are coloured blue?



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

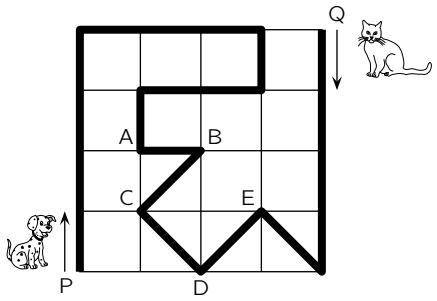
Solution:

 # 9. Four baskets contain 1, 4, 6 and 9 apples respectively. How many apples should be moved between the baskets to have the same number of apples in each basket?

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

SOLUTION: Total apples are 1+4+6+9=20 so each basket must have 20:4=5 apples. So must remove 1 apple from the basket with 6 and also 4 apples from the basket with 9. Total 1+4=5. You can distribute these to the other baskets and we are done.

 # 10. A dog and a cat walk in the park along the path marked by the thick black line. The dog starts from P at the same time as the cat starts from Q. The dogs walks three times as fast as the cat. At which point do they meet.

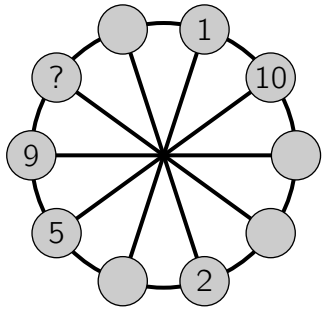


(**A**) at A (**B**) at B (**C**) at C (**D**) at D (**E**) at E

SOLUTION:

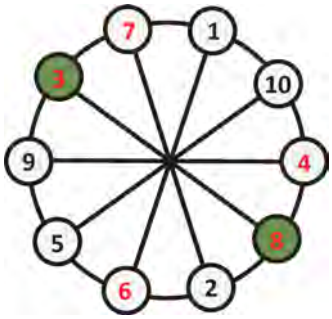
4 points

 # 11. The numbers from 1 to 10 have to be placed in the small circles, one in each circle. Numbers in any two neighbouring circles must have the same sum as the numbers in the two diametrically opposite circles. Some of the numbers are already placed. What number should be placed in the circle with the question mark?



(**A**) 3 (**B**) 4 (**C**) 6 (**D**) 7 (**E**) 8

SOLUTION: We fill in the numbers in the following order: $6 \to 7 \to 4$. Now only the numbers 3 and 8 remain for the two remaining (green) circles. By inspection we see how to place them (3 on the left and 8 on the right, rather than the other way round).



 # 12. When Elise the bat leaves her cave, a digital clock shows 20:20
When she returns and is hanging upside down, she sees 20:20 on the clock again.

How long has she been away from her cave?

(**A**) 3 hours and 28 minutes (**B**) 3 hours and 40 minutes (**C**) 3 hours and 42 minutes

(**D**) 4 hoursand and 18 minutes (**E**) 5 hours and 42 minutes

SOLUTION:

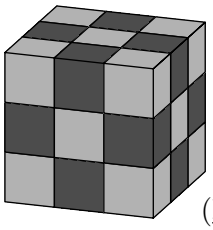
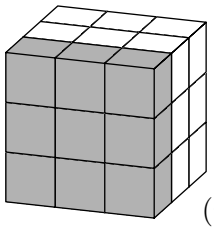
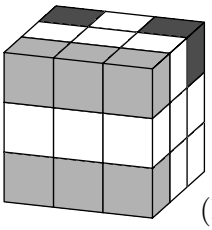
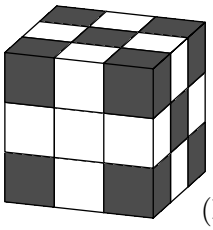
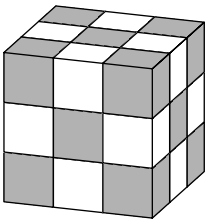
 # 13. An elf and a troll meet. The troll always lies, while the elf always tells the truth. They both say exactly one of the following sentences: which one?

(**A**) I am telling the truth (**B**) You are telling the truth (**C**) We both are telling the truth

(**D**) I always lie (**E**) One and only one of us is telling the truth

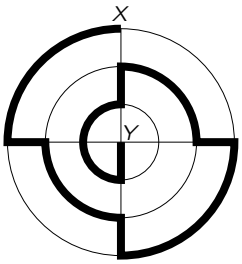
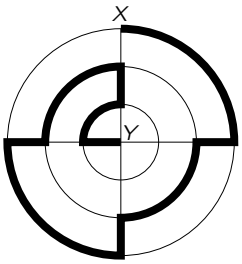
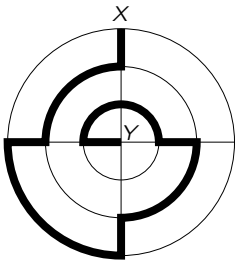
SOLUTION:

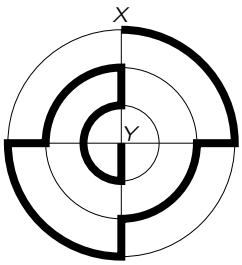
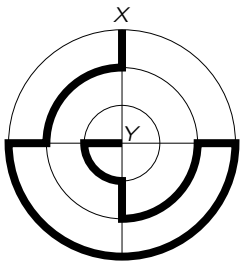
 # 14. Mary has exactly 10 white cubes, 9 light grey cubes and 8 dark grey cubes, all of the same size. She glues all these cubes together to build a big cube. One of the cubes below is the one she builds. Which one is it?

(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

SOLUTION:

 # 15. The diagrams show five paths from X to Y marked with a thick line. Which path is the shortest?

(**A**)  (**B**)  (**C**) 

(**D**)  (**E**) 

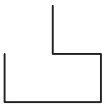
SOLUTION: The idea is to compare and not measure the length of the various paths. The straight sections are of the same length in all cases. Also the circular part of the paths in the middle circle is the same in all cases. So we can ignore these. We can also ignore one quarter circle of the outer circle and one quarter of a circle in the small inside circle from each path. In the end we have left over with a) a small quarter circle and a large quarter circle in path A and also in D, b) a large quarter circle in path B and also in E, c) a small quarter circle in path A. So clearly C ¡ B = E ¡ A = D. So path C is the shortest.

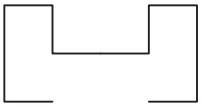
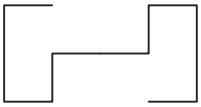
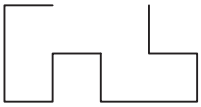
 # 16. A father kangaroo lives with his three children. They decide on all matters by vote, and each member of the family gets as many votes as its age. The father is aged 36 and the children are 13,

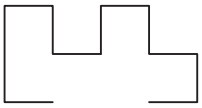
6 and 4 years old, so the father always wins. How many years will it take for the children to win all votes, if they all agree?

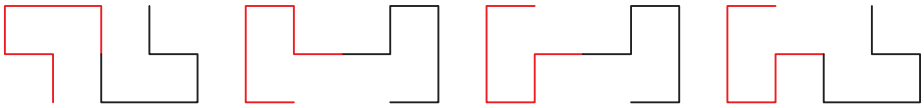
(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 13 (**E**) 14

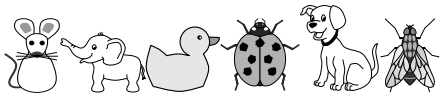
SOLUTION:

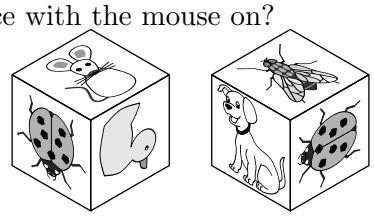
 # 17. Giorgio has two equal pieces of wire of shape  . Which of the following shapes cannot be obtained putting together these two pieces?

(**A**)  (**B**)  (**C**)  (**D**) 

(**E**) 

SOLUTION: This is shape E, see 

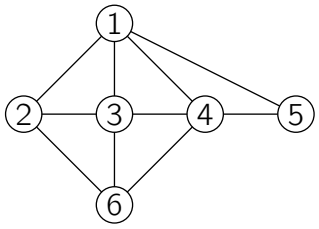
 # 18. Amy glues the six stickers shown onto the faces of a cube:  The pictures below show the cube in two different positions. Which sticker is on the face opposite the face with the mouse on?



(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

SOLUTION:

 # 19. The picture below shows the friendships of the six girls Ann, Beatrice, Chloe, Diana, Elisabeth and Fiona. Each number represents one of the girls and each line joining two numbers represents a friendship between those two girls. Chloe, Diana and Fiona each have four friends. Beatrice is friends with only Chloe and Diana. Which number represents Fiona?

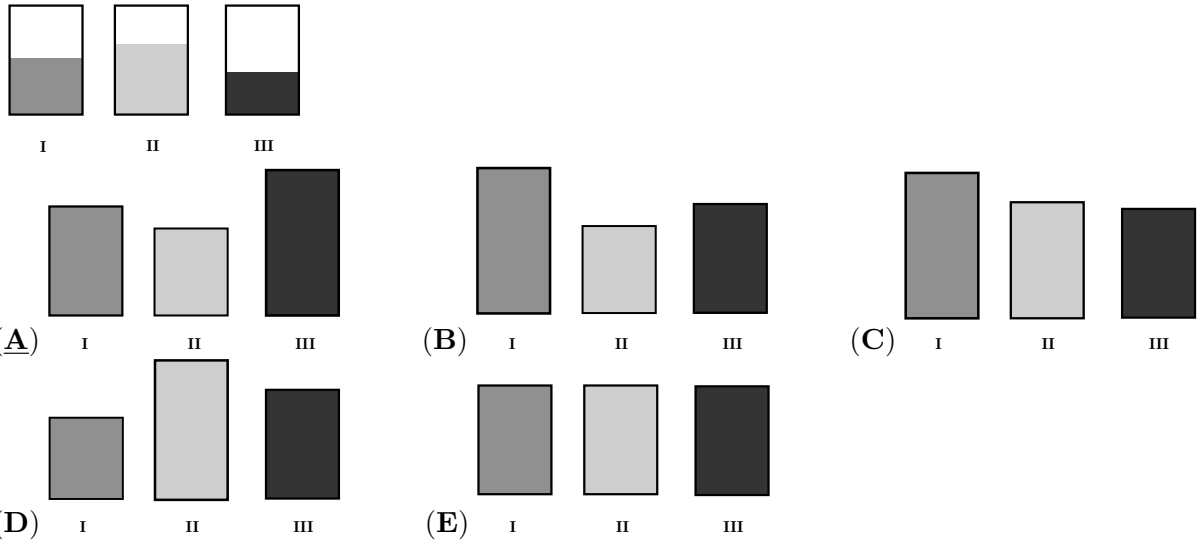


(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 6

SOLUTION:

 # 20. Mary put the same amount of liquid in three rectangular vessels. Viewed from the front, they

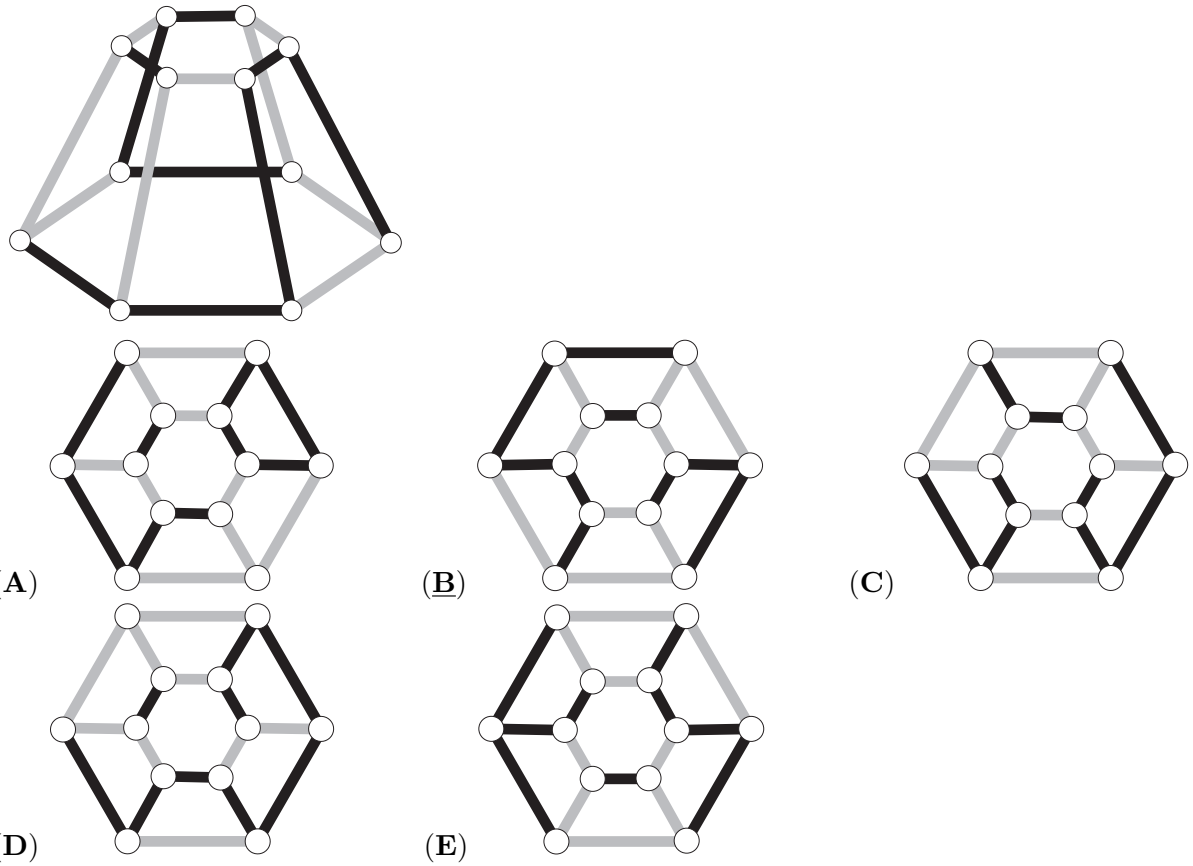
seem to have the same size, but the liquid has risen to different levels in the three vessels. Which of the following images represents the three vessels when viewed from above?



Solution:

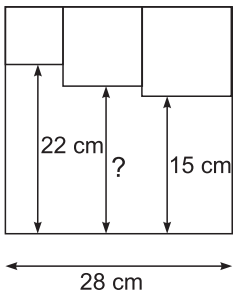
5 points

 # 21. What does the object in the picture look like when viewed from above?



Solution:

 # 22. Three small squares are drawn inside a larger square as shown. What is the length of the line

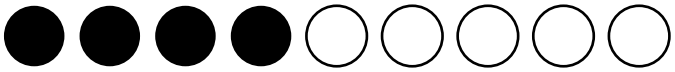


marked with a question mark?

(**A**) 17 cm (**B**) 17.5 cm (**C**) 18 cm (**D**) 18.5 cm (**E**) 19 cm

Solution:

 # 23. Nine tokens are black on one side and white on the other. Initially, four tokens have the black side upwards.

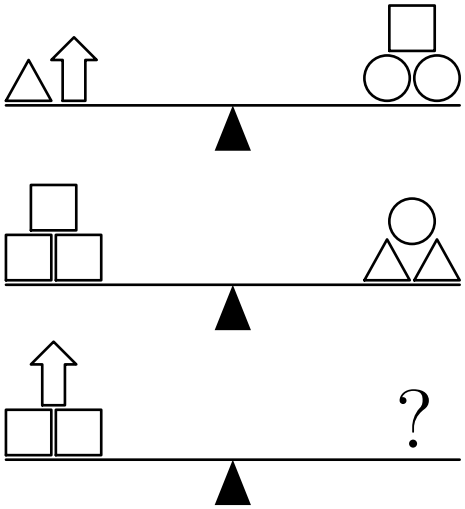


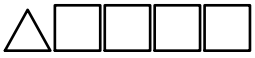
In each turn you have to flip three tokens. What is the least number of turns you need to have all tokens showing the same colour?

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

Solution:

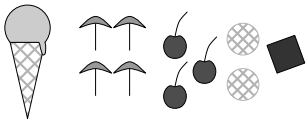
 # 24. Which of the following options will definitely balance the third scale?



(**A**) 
(**B**) 
(**C**) 
(**D**) 
(**E**) 

Solution:

 # 25. Ten people each order one scoop of ice cream. They order 4 scoops of vanilla, 3 scoops of chocolate, 2 scoops of lemon and 1 scoop of mango. They top the ice creams with 4 umbrellas, 3 cherries, 2 wafers and 1 chocolate chip. They use one topping on each scoop, such that no two ice creams are alike. Which of the following combinations is NOT possible.



(**A**) chocolate with a cherry (**B**) mango with an umbrella (**C**) vanilla with an umbrella
(**D**) lemon with a wafer (**E**) vanilla with a chocolate chip

Solution:

 # 26. We call a 3-digit number *nice* if its middle digit is greater than the sum of its first and last digits. What is the largest possible number of consecutive *nice* 3-digit numbers?

(**A**) 5 (**B**) 6 (**C**) 7 (**D**) 8 (**E**) 9

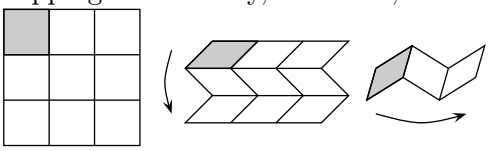
Solution:

 # 27. Magnus has to play 15 games in a chess tournament. At some point during the tournament he has won half of the games he has played, he has lost one third of the games he has played and two have ended in a draw. How many games has Magnus still to play?

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

Solution:

 # 28. Vadim has a square piece of paper divided into nine cells. He folds the paper as shown - overlapping horizontally, and then, vertically so that the grey square ends on top.

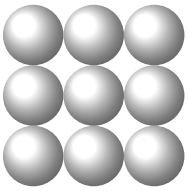
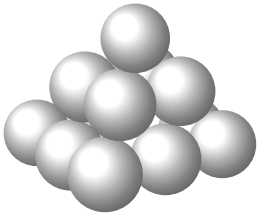


Vadim wants to write the numbers from 1 to 9 into the cells so that, once the paper is folded, the numbers would be in increasing order with number 1 on the top layer. What numbers should he write instead of a, b and c?

1	a	
		c
	b	

(**A**) $a = 6$, $b = 4$, $c = 8$ (**B**) $a = 4$, $b = 6$, $c = 8$ (**C**) $a = 5$, $b = 7$, $c = 9$
(**D**) $a = 4$, $b = 5$, $c = 7$ (**E**) $a = 6$, $b = 4$, $c = 7$

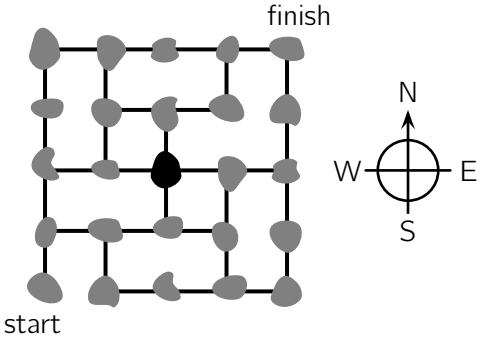
Solution:

 # 29. Don builds a pyramid with balls. The square base consists of 3×3 balls:  The middle layer has 2×2 balls, and there is one ball at the top.  There is glue at each contact point between two balls. How many glue points are there?

(**A**) 20 (**B**) 24 (**C**) 28 (**D**) 32 (**E**) 36

Solution:

 # 30. The figure shows a map of some islands and how they are connected by bridges. A postman has to visit each island exactly once. He starts on the island marked "start" and would like to finish on the island marked "finish". He has just reached the black island in the centre of the map. In which direction should he move to be able to complete his route?



(**A**) by going North (**B**) by going East (**C**) by going South

(**D**) by going West (**E**) there is no such path as the postman wishes to follow

SOLUTION: Solution: One does not attempt to draw the whole path in one go, by trial and error. The idea is to discover gradually parts of the path. For example there are some islands that are connected by exactly two others. So, ignoring the islands "start" and "finish", the path through those islands is uniquely determined (it comes from one of the two neighbours through the island and on to the other neighbour). On the map we have marked green such island and the path that necessarily goes through them. Now it is easy to complete the path. It has a unique solution, as shown in red on the right. So from the island in the middle the postman must move East.