

MK Level 1-2 Collection of Common Mistakes in 4 & 5 Point Questions

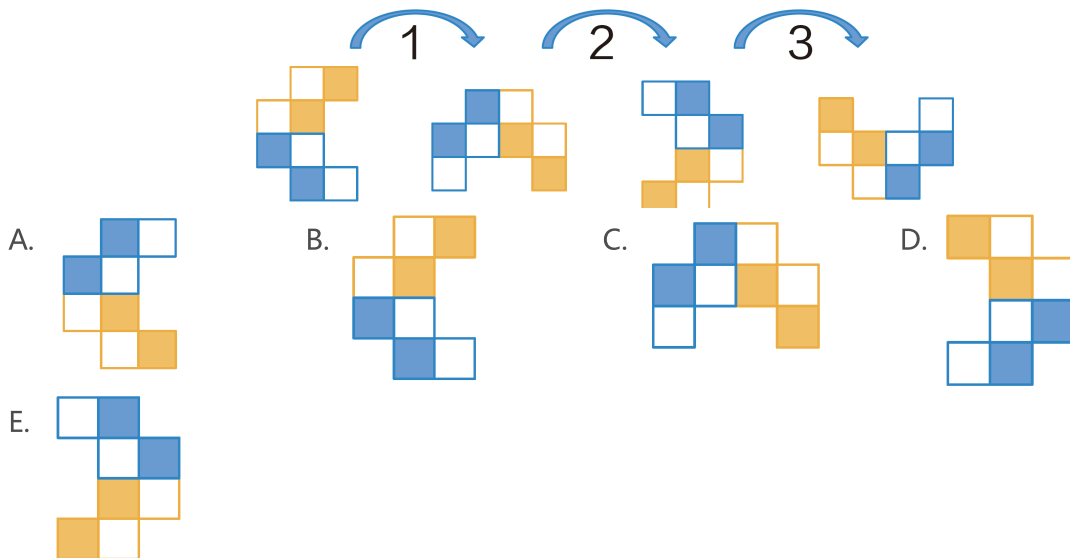
Past Competition Questions

4 points

- 1 Vera invited 13 guests to her birthday party. She had 2 pizzas, and each of them was cut into 8 slices. Each person at the party ate one slice of pizza. How many slices of pizza were left over? (US 2015 Math kangaroo Problems, Level 1 – 2, Question #14)
- A. 5 B. 4 C. 3 D. 2 E. 1

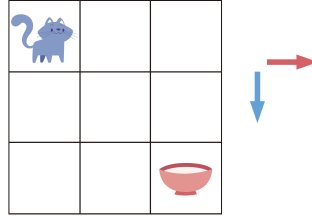
- 2 Alfred is rotating a shape six times. The first three rotations are shown in the picture. How does the shape look like at the end?

(US 2017 Math kangaroo Problems, Level 1-2, Question #11)



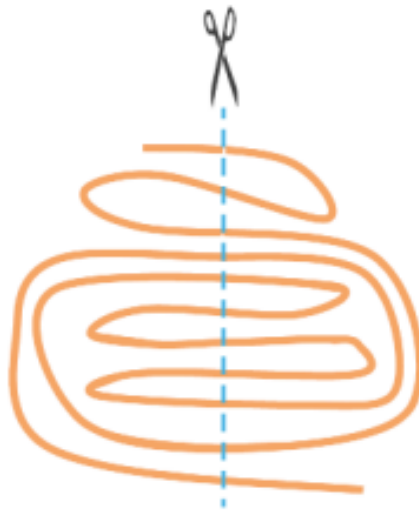
- 3 A cat and a bowl of milk are in the opposite corners of the board. The cat can only move as shown by the arrows. In how many ways can the cat reach the milk?

(US 2019 Math kangaroo Problems, Level 1-2, Question #12)



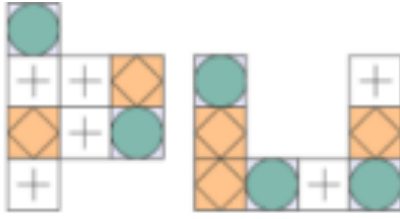
- A. 2 B. 3 C. 4 D. 5 E. 6

- 4 Edmund cut a ribbon as shown in the picture. How many pieces of the ribbon did he end up with? (MK 2021 Grades 1 and 2 Problem 9)



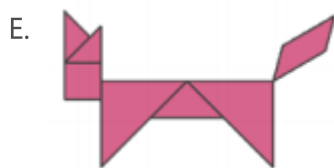
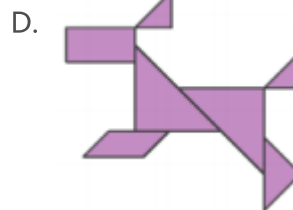
- A. 9 B. 10 C. 11 D. 12 E. 13

5



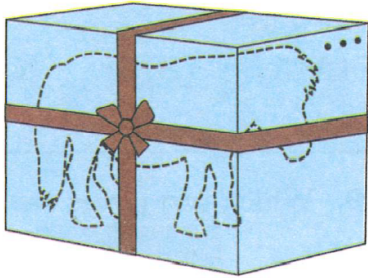
- A.

6



- 7 A toy pony is inside a box that is 1 meter tall, 1 meter wide, and 2 meters long. A ribbon goes around the box, as shown. The knot uses an extra 1 meter of ribbon. How long is the ribbon in total?

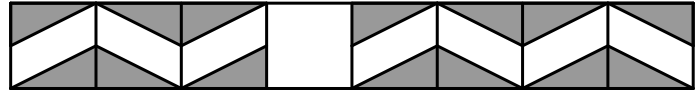
(US 2024 Math kangaroo Problems, Level 1-2, Question #13)



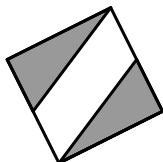
- A. 9 meters B. 11 meters C. 13 meters D. 15 meters E. 17 meters

5 points

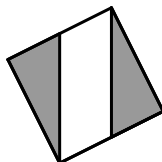
8 (US 2013 Math kangaroo Problems, Level 1 – 2, Question #21)



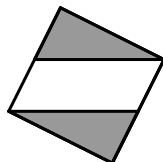
A tile falls off the wall Caroline has three extra tiles (see the picture below).



tile *a*



tile *b*



tile *c*

Which tiles fit the pattern? ()

- | | |
|--------------------------|--------------------------|
| A. only <i>b</i> | B. <i>a</i> and <i>b</i> |
| C. <i>b</i> and <i>c</i> | D. only <i>c</i> |
| E. all three of them fit | |

9 (US 2015 Math kangaroo Problems, Level 1 – 2, Question #23)

Sylvia, Tara, Una and Wanda went out for dessert. They stood in line one after another. Each one of them ordered one of the following desserts: ice cream, waffle, bun, and cake, and each one ordered a different item. We know that:

- The first girl did not buy the ice cream or the waffle.
- Una was not last in line, and she bought the cake.
- Sylvia, who was standing behind Tara and in front of Una, did not buy the waffle.

Which of the following is true? ()

- | | |
|-----------------------------|-------------------------------|
| A. Wanda was first in line. | B. Tara bought the ice cream. |
| C. Wanda bought the waffle. | D. Una was second in line. |
| E. Sylvia bought the bun. | |

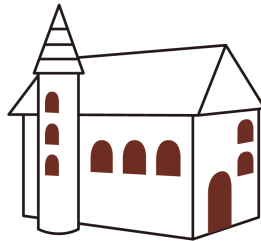
10 (US 2015 Math kangaroo Problems, Level 1 – 2, Question #24)

We left for a summer camp yesterday at 4 : 32 PM and got to our destination today at 6 : 11 AM. How long did we travel? ()

- A. 13 hours 39 minutes
- B. 14 hours 39 minutes
- C. 14 hours 21 minutes
- D. 13 hours 21 minutes
- E. 2 hours 21 minutes

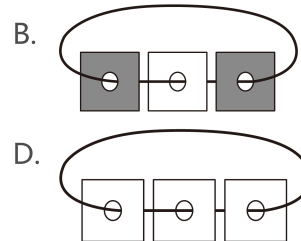
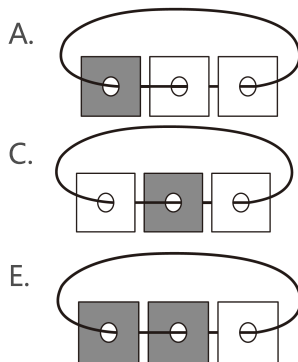
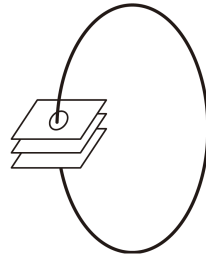
11 Which stamp has been used to get the picture below?

(US 2017 Math Kangaroo Problems, Level 1-2, Question #17)



- 12 Given three cards with holes. The top of each card is white and the bottom is grey. Basil puts a string through the holes, as in the figure below. By arranging the cards, which figure is possible to get?

(US 2017 Math kangaroo Problems, Level 1-2, Question #20)



- 13 A figure has been cut into 3 pieces as below. Which figure could have been cut?

(US 2019 Math kangaroo Problems, Level 1-2, Question #18)



- 14 Here are nine squares: . First, Ani replaced all the black squares with white ones. Next, Bob replaced all the gray squares with black ones. Finally, Chris replaced all the white squares with gray ones. What did they get at the end? (2019 Math Kangaroo Problem, Level 1-2, Question #22)

- A.  B. 
 C.  D. 
 E. 

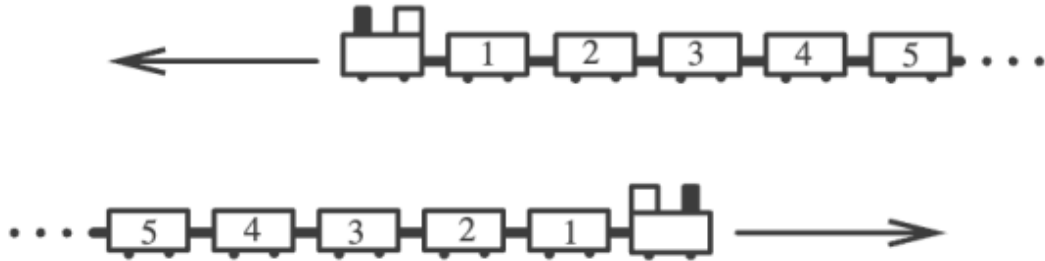
- 15 Peter chose a square of four cells in the table below so that the sum of the four numbers inside the square is greater than 63. Which of the following numbers must be in the chosen square?

(US 2019 Math kangaroo Problems, Level 1-2, Question #23)

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

- A. 14 B. 15 C. 17 D. 18 E. 20

- 16 Two identical trains, each with 31 cars, are traveling in opposite directions. When car number 19 of one train is opposite car number 19 of the other, which car is opposite car number 12? (MK 2020 Grades 1-2 Problem 18)



- A. 7 B. 12 C. 21 D. 26 E. 31

- 17 Mark the Bee can walk only on gray cells. In how many ways can you color exactly two white cells gray so that Mark can walk from A to B? (MK 2020 Grades 1-2 Problem 19)



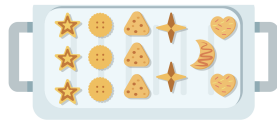
- A. 3 B. 4 C. 5 D. 6 E. 7

- 18 John and Olivia exchanged sweets. First, John gave Olivia as many sweets as Olivia had. Then Olivia gave John as many sweets as John had after the first exchange. After these two exchanges, each had 4 sweets. How many sweets did John have at the beginning? (MK 2020 Grades 1-2 Problem 24)

A. 6 B. 5 C. 4 D. 3 E. 2

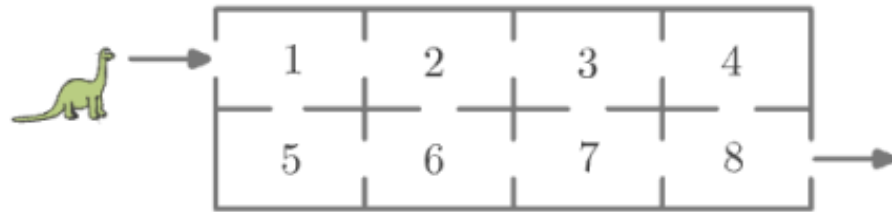
- 19 Each participant in a cooking contest baked one tray of cookies like the one shown. What is the smallest number of trays of cookies needed to make the following plate?

(US 2021 Math kangaroo Problems, Level 1-2, Question #23)



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

- 20 Dino moves from the entrance to the exit by going through rooms. He can only go through each room once.



Dino adds up the numbers as he passes through each room. What is the highest total

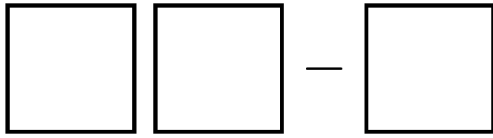
Dino can make? (MK 2022 Grades 1 and 2 Problem 20)

- A. 27 B. 29 C. 32 D. 34 E. 36

- 21 Three frogs live in a pond. Each night, one of the frogs sing n song to the other two. After 9 nights, one of the frogs had sung 2 times. Another frog had listened to 5 songs. How many songs had the third frog listened to?

- A. 7 B. 6 C. 5 D. 4 E. 3

- 22 Digits 1, 1, 2 and 3 are printed on four different cards. Three cards are laid out to make a subtraction, as shown in the picture. How many different results can be obtained?



- A. 6 B. 8 C. 10 D. 12 E. 24

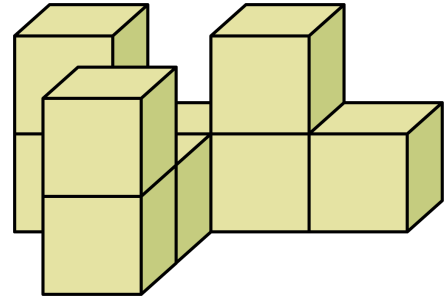
- 23 Andrew was throwing darts at a target. He started with 10 darts and got 2 new darts each time he hit the target. In total, Andrew threw 20 darts and then had no darts left. How many times did Andrew hit the target?

- A. 4 B. 5 C. 6 D. 8 E. 10

Mock Test Questions

4 points

24 Observing the cubes below from the left, how many squares can you see?



A. 9

B. 4

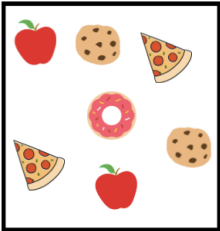
C. 6

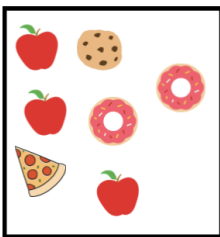
D. 5

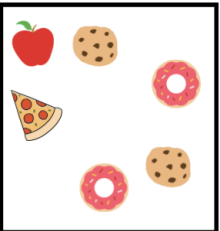
E. 3

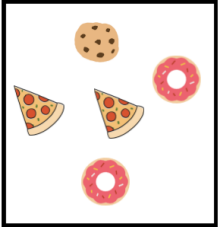
- 25 Anna has organized her snacks into 5 baskets. Each snack has a different cost, and all the baskets should add up to the same total. However, one of the baskets has a different total amount. Can you help Anna figure out which basket has a different total?

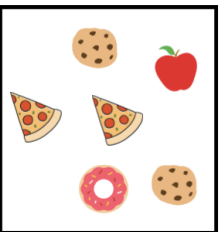


A. 

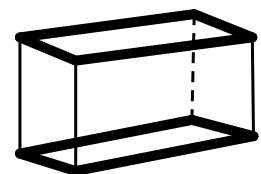
B. 

C. 

D. 

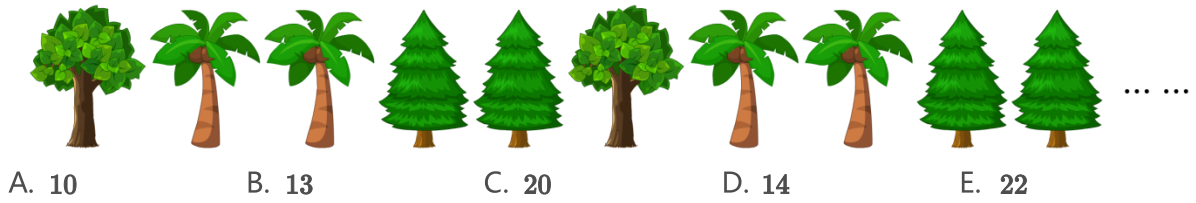
E. 

- 26 Lily is decorating a gift box by wrapping a ribbon around a box that is 150 centimeters long, 30 centimeters wide, and 60 centimeters high, as shown by the two black lines in the figure. How long is the ribbon?

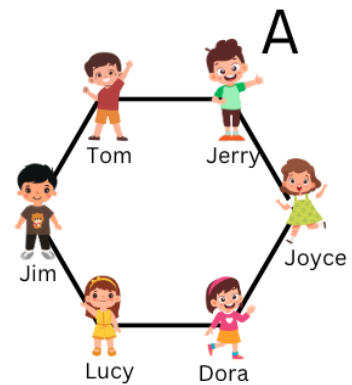


- A. 360cm B. 720cm C. 125cm D. 960cm

- 27 Eddie and others are planting trees in a garden, following the order of 1 willow tree, 2 coconut trees, and 2 pine trees. A total of 32 trees were planted. How many coconut trees were planted?

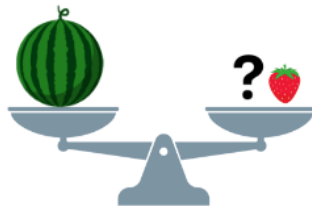


- 28 Six kids are running around a hexagon in a clockwise direction. After running three laps, who will be at corner A?



- A. Joyce
- B. Jerry
- C. Tom
- D. Jim
- E. Lucy

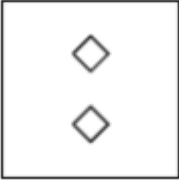
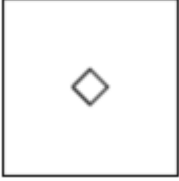
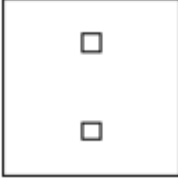
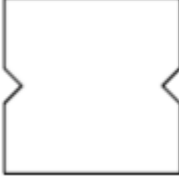
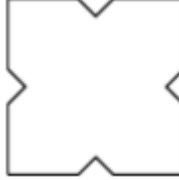
- 29 According to the following scales, how many strawberries do we need on the right side in order to make the scale balance?



- A. 12 B. 18 C. 7 D. 9 E. 5

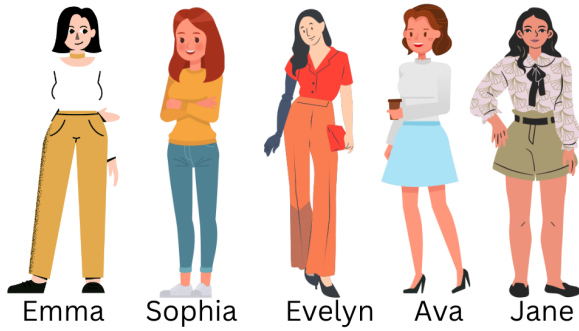
- 30 Which is the result of unfolding the paper?



- A.  B.  C.  D. 
- E. 

31 There are five ladies standing outside the school. One of them is Mia's mom. We know that Mia's mom

- (1) doesn't wear a skirt
- (2) has long hair
- (3) doesn't have a purse



Which of them is Mia's mom?

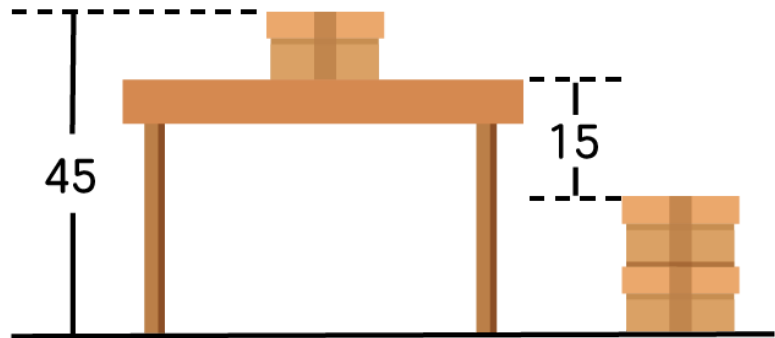
- A. Emma B. Sophia C. Evelyn D. Ava E. Jane

32 Nancy needs to choose 2 round buttons and 1 square button from the buttons below. How many different choices are there?



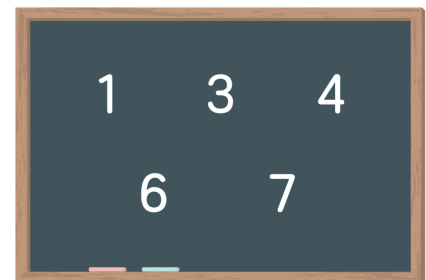
- A. 3 B. 4 C. 5 D. 6 E. 8

- 33 There are 3 boxes of the same size placed on and beside the table as shown below.
What is the height of the table?



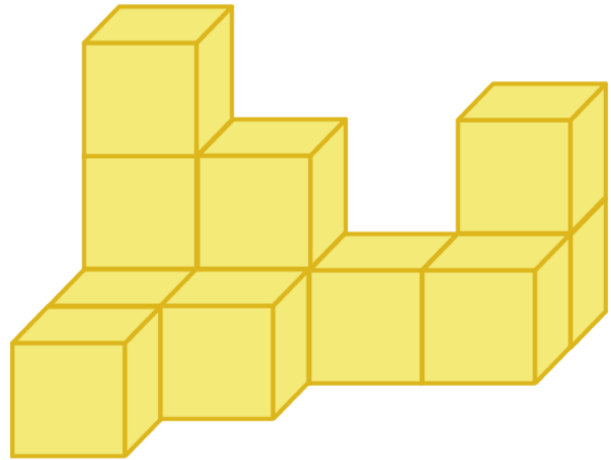
- A. 10 B. 15 C. 20 D. 30 E. 35

- 34 John wants to pick two numbers from the board and add them together. How many different results could he get?



- A. 5 B. 6 C. 7 D. 8 E. 10

- 35 Thomas made the shape shown using 12 cubes. He put one drop of glue between any two cubes that share a common face. How many drops of glue did he use?



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

5 points

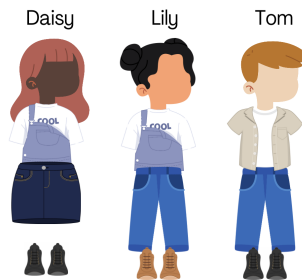
- 36 Eddie uses the cards below to practice addition. Each time, he draws three cards simultaneously and put them into a group and record. There are how many different possible combination of numbers?



- A. 7 B. 8 C. 9 D. 10 E. 11

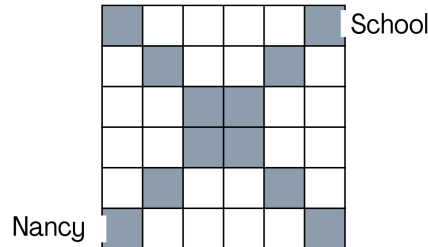
- 37 Daisy, Lily, and Tom each have 3 different outfits. For each outfit that Brian has, at least two other children have that same outfit as well.

Which combination of outfits does Brian wear today?



- A.   
- B.   
- C.   
- D.   
- E.   

- 38 Nancy wants to move through the map to go to school. She can only move to the right (→) or upwards (↑). Each time she visits a gray box, she has to pay 3 dollars. Each time she visits a white box, she has to pay 1 dollar. How much would she pay for the cheapest path?



- A. 20 dollars B. 19 dollars C. 18 dollars D. 17 dollars E. 16 dollars

- 39 Julia has a list of problems to finish during May. She starts on the 1st of May, which this year is a Wednesday. If she solves exactly 5 problems each day, she will finish the task on a Thursday. If she solves exactly 3 problems each day, she will finish the task on a Wednesday. How many problems are on the list?



- A. 6 B. 12 C. 24 D. 45 E. 66

- 40 A frog wants to smell the lotus in the pond. He can only move upward or to the right.

What is the greatest sum of the numbers along the path?

3	4	1	7
2	1	5	2
3	8	3	6
1	9	4	1

- A. 13 B. 35 C. 42 D. 36 E. 31

- 41 Place the digits 1, 2, 3, 4, and 5 in the squares to create the largest possible three-digit number and calculate the sum. To make the sum greatest, what should the three-digit number be?

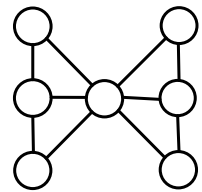
$$\square\square\square + \square\square$$

- A. 542 B. 531 C. 123 D. 521 E. 572

- 42 Charlotte picks mushrooms for 4 days. Each day, she picks 3 more than the previous one. On day 4, she picks ten times the number of mushrooms she picked on the first day. How many mushrooms did she pick in total over 4 days?

A. 1 B. 22 C. 15 D. 10 E. 18

- 43 Input the numbers 1, 2, 3, 4, 5, 6 and 7 into the circles so that the sum of each line is the same. What is the sum of each line?



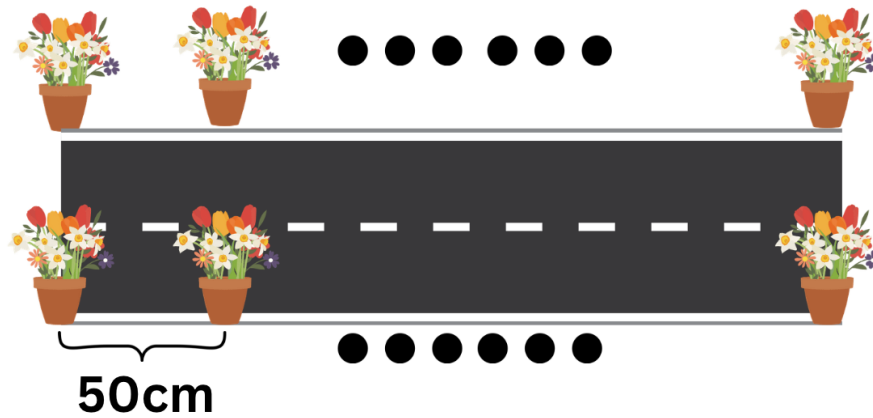
A. 4 B. 12 C. 10 D. 8 E. 15

- 44 Here are 11 squares. First, Stacy replaced all the white squares with blue ones. Next, Jerry replaced all the black squares with white ones. Finally, Louis replaced all the blue squares with black ones. What did they get at the end?



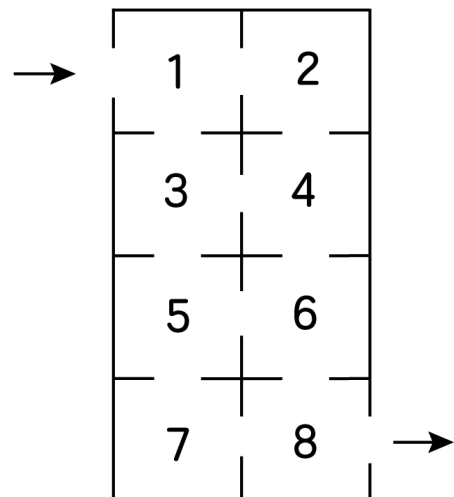
- A.  B. 
- C.  D. 
- E. 

- 45 Kathy wants to decorate both sides of the road in front of her home. On each side, she places a pot of flowers every 50 cm. In total, she uses 20 pots of flowers. How long is the road?



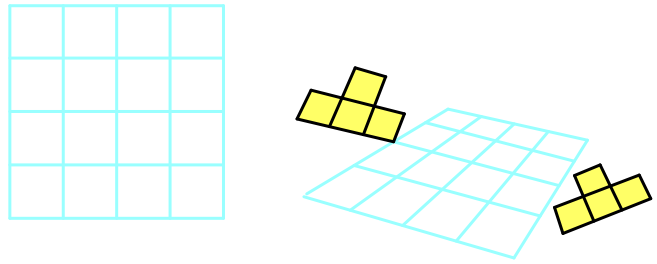
- A. 450cm B. 500cm C. 1000cm D. 950cm E. 1050cm

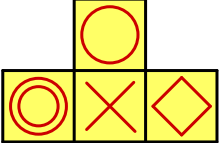
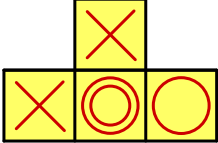
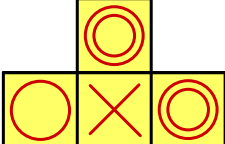
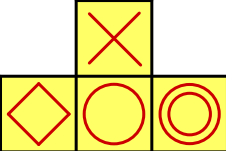
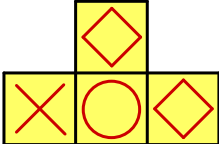
- 46 Dino moves from the entrance to the exit by going through some rooms. He can only go through each room once. Dino adds up the numbers as he passes through each room. What is the largest result Dino can get?



- A. 27 B. 29 C. 32 D. 34 E. 36

- 47 Choose 4 pieces from the options to fill in the grid, ensuring that each shape appears exactly once in every row and column. Which piece is left out?



- A. 
- B. 
- C. 
- D. 
- E. 

- 48 There are some cats and 10 dogs, each of them is white or orange. There are three more cats than the total number of orange animals. There are 6 white dogs. How many white cats are there?

A. 4 B. 5 C. 6 D. 7 E. 8

49 Tom and Emma exchanged marbles. First, Tom gave Emma as many marbles as Emma had. Then Emma gave Tom as many marbles as Tom had after the first exchange. After these two exchanges, each had 8 marbles. How many marbles did Emma have at the beginning?

- A. 6 B. 8 C. 10 D. 12 E. 16

50 Alice, Bob, Charlie, and Diana went to a pet store to buy different pets. They stood in line, one after another. Each of them bought a different pet: a dog, a cat, a bird, and a fish. We know that:

- (1) The last person did not buy the dog or the bird.
- (2) Charlie was not first in line, and he bought the fish.
- (3) Alice, who was standing behind Charlie and in front of Bob, did not buy the bird.

Which of the following is true?

- A. Diana was last in line. B. Bob bought the bird.
C. Charlie was third in line. D. Alice bought the dog.
E. Diana bought the cat.

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Past Competition Questions

4 points

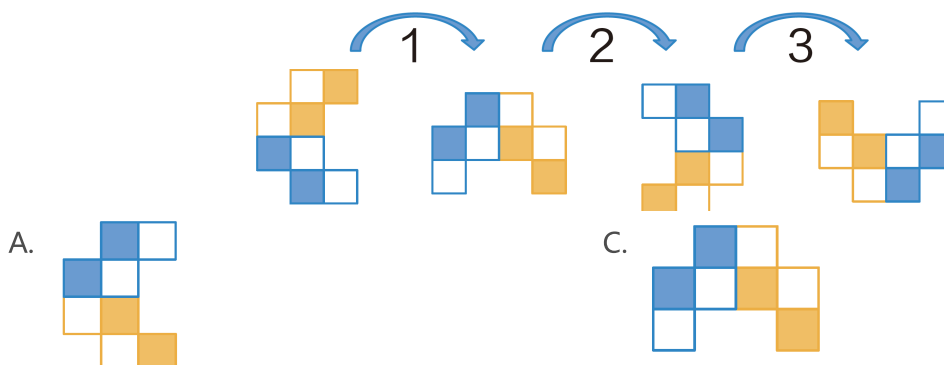
- 1 Vera invited 13 guests to her birthday party. She had 2 pizzas, and each of them was cut into 8 slices. Each person at the party ate one slice of pizza. How many slices of pizza were left over? (US 2015 Math kangaroo Problems, Level 1 – 2, Question #14)
- A. 5 B. 4 C. 3 D. 2 E. 1

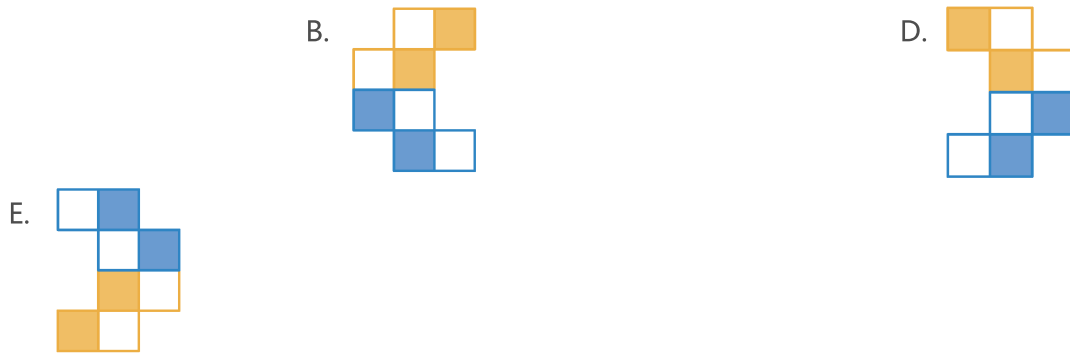
Answer D

Solution Each of the 2 pizzas was cut into 8 slices for a total of $8 + 8 = 16$ slices. Each of the 13 guests had a slice of pizza and so did Vera. From the 16 slices of pizza, 13 were eaten by the guests and 1 slice was eaten by Vera. Subtract to find out how many slices remain. There were $16 - 14 = 2$ slices of pizza left over.

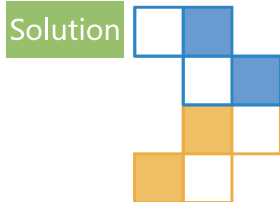
- 2 Alfred is rotating a shape six times. The first three rotations are shown in the picture. How does the shape look like at the end?

(US 2017 Math kangaroo Problems, Level 1-2, Question #11)





Answer E

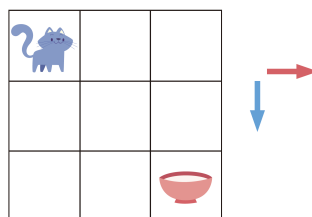


【Answer】 E

【Resolution】 From our observation, the figure in this question will return to its original direction every four rotations. So after the sixth rotation, it will result in the same direction as the second one. The correct answer is E.

- 3 A cat and a bowl of milk are in the opposite corners of the board. The cat can only move as shown by the arrows. In how many ways can the cat reach the milk?

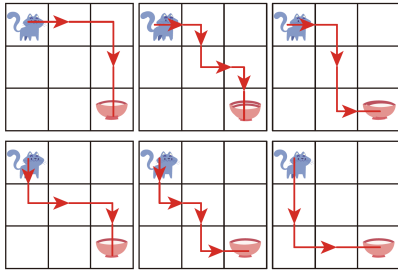
(US 2019 Math kangaroo Problems, Level 1-2, Question #12)



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

Answer E

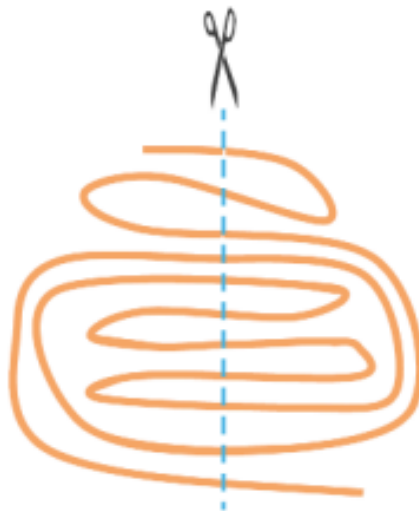
Solution



【Answer】 E

【Resolution】 As shown in the figure, we can draw the route of the cat according to the question and complete the modeling. There are 6 different routes. The correct answer is E.

- 4 Edmund cut a ribbon as shown in the picture. How many pieces of the ribbon did he end up with? (MK 2021 Grades 1 and 2 Problem 9)

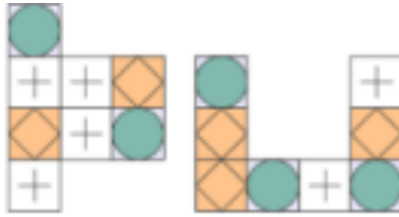


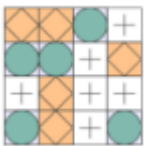
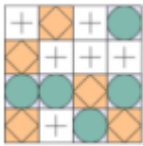
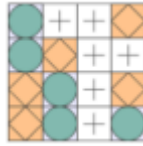
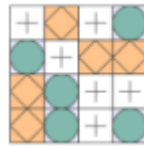
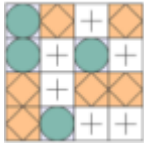
- A. 9 B. 10 C. 11 D. 12 E. 13

Answer D

Solution It's easier to count the number of cuts than to follow the winding string. There is always one more piece than the number of cuts. For example, one cut divides a string into two pieces and two cuts divide it into three pieces. There are 11 cuts, marked with dots on this picture, so there are 12 pieces of ribbon.

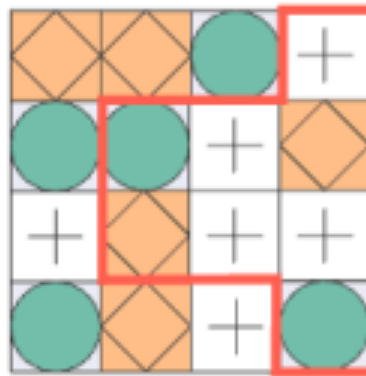
5 Which figure can be made from these two pieces? (MK 2021 Grades 1 and 2 Problem 13)



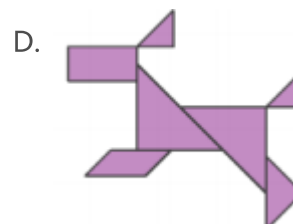
- A.  B.  C.  D.  E. 

Answer A

Solution Both pieces will need to be rotated to fit together and to match one of pictures shown.



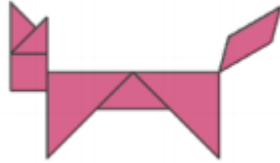
6 One of the pictures below uses a geometric shape that the others do not. Which picture is it? (MK 2022 Grades 1 and 2 Problem 12)



C.



E.



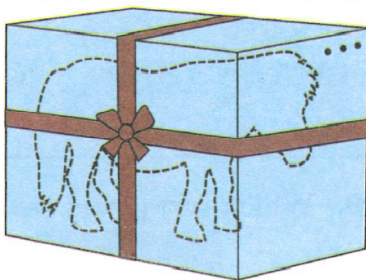
Answer D

Solution The rectangle appears only in answer D. The other shapes have a square instead.

7

A toy pony is inside a box that is 1 meter tall, 1 meter wide, and 2 meters long. A ribbon goes around the box, as shown. The knot uses an extra 1 meter of ribbon. How long is the ribbon in total?

(US 2024 Math kangaroo Problems, Level 1-2, Question #13)



A. 9 meters

B. 11 meters

C. 13 meters

D. 15 meters

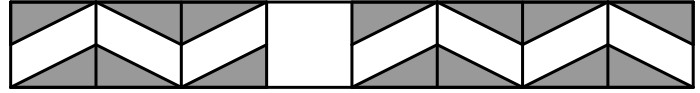
E. 17 meters

Answer B

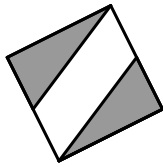
Solution $(2 + 1) \times 2 + (1 + 1) \times 2 + 1 = 11$ meters, Answer is B.

5 points

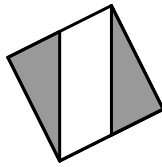
8 (US 2013 Math kangaroo Problems, Level 1 – 2, Question #21)



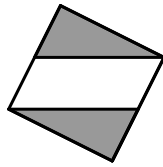
A tile falls off the wall Caroline has three extra tiles (see the picture below).



tile *a*



tile *b*



tile *c*

Which tiles fit the pattern? ()

A. only *b*

B. *a* and *b*

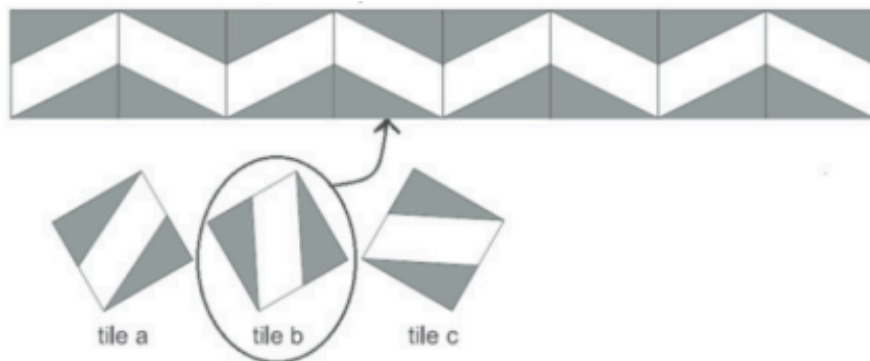
C. *b* and *c*

D. only *c*

E. all three of them fit

Answer A

Solution Only tile *b* matches the pattern as picture below shows (the tile has to be turned counterclockwise to fit the empty spot):



9 (US 2015 Math kangaroo Problems, Level 1 – 2, Question #23)

Sylvia, Tara, Una and Wanda went out for dessert. They stood in line one after another. Each one of them ordered one of the following desserts: ice cream, waffle, bun, and cake, and each one ordered a different item. We know that:

- The first girl did not buy the ice cream or the waffle.
- Una was not last in line, and she bought the cake.
- Sylvia, who was standing behind Tara and in front of Una, did not buy the waffle.

Which of the following is true? ()

- A. Wanda was first in line.
- B. Tara bought the ice cream.
- C. Wanda bought the waffle.
- D. Una was second in line.
- E. Sylvia bought the bun.

Answer C

Solution From the last statement we know that the order of the girls was Tara, then Sylvia, then Una.

From the second statement we know Una was not last, so she must have been followed by Wanda, who was the last girl. Since Una did buy the cake, we have the following order:

- Tara
- Sylvia
- Una with the cake
- Wanda

The first girl did not buy the ice cream or waffle, so only the bun was left. Sylvia did not buy the waffle so she bought the ice cream. We have:

- Tara with the bun
- Sylvia with the ice cream
- Una with the cake
- Wanda with the waffle

10 (US 2015 Math kangaroo Problems, Level 1 – 2, Question #24)

We left for a summer camp yesterday at 4 : 32 PM and got to our destination today at 6 : 11 AM. How long did we travel? ()

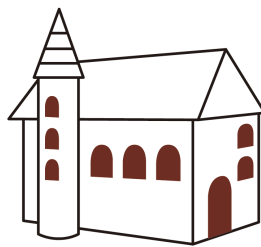
- A. 13 hours 39 minutes
- B. 14 hours 39 minutes
- C. 14 hours 21 minutes
- D. 13 hours 21 minutes
- E. 2 hours 21 minutes

Answer A

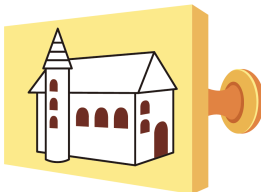
Solution From 4 : 32 p.m. until 5 : 00 p.m. is 28 minutes. From 5 : 00 p.m. to midnight is 7 hours, and from midnight to 6 : 11 a.m. is 6 hours and 11 minutes. We add up the hours to obtain $6 + 7 = 13$ hours, and we add up the minutes to obtain $28 + 11 = 39$ minutes. The total travel time was 13 hours and 39 minutes.

11 Which stamp has been used to get the picture below?

(US 2017 Math Kangaroo Problems, Level 1-2, Question #17)



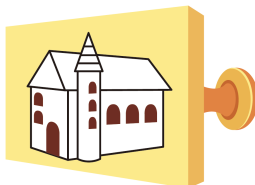
A.



B.



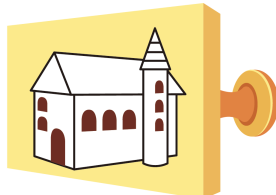
C.



D.



E.



Answer E

Solution

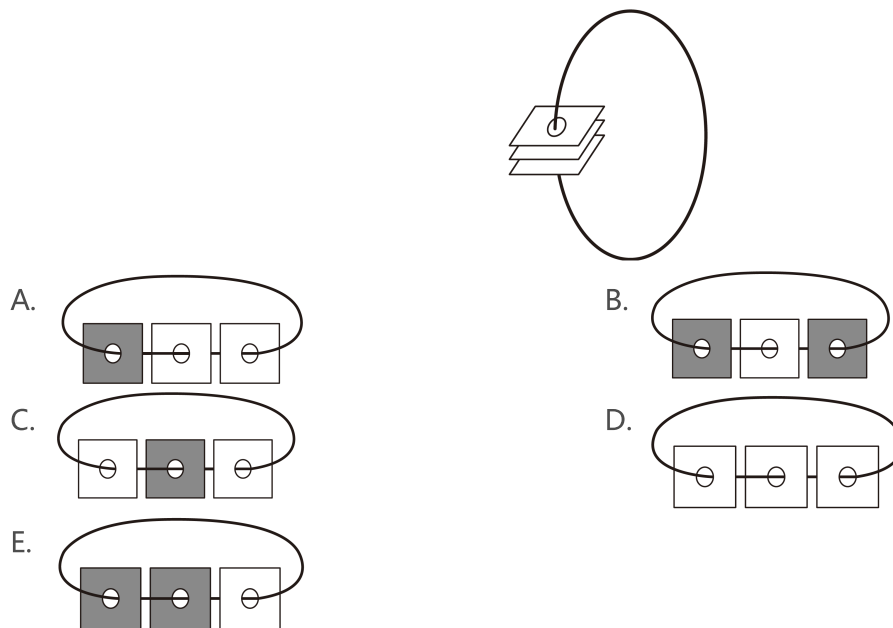


【Answer】 E

【Resolution】 The figure shown on the stamp is axisymmetric to the printed figure, with the same shape in opposite direction. So the answer is E.

- 12 Given three cards with holes. The top of each card is white and the bottom is grey. Basil puts a string through the holes, as in the figure below. By arranging the cards, which figure is possible to get?

(US 2017 Math kangaroo Problems, Level 1-2, Question #20)



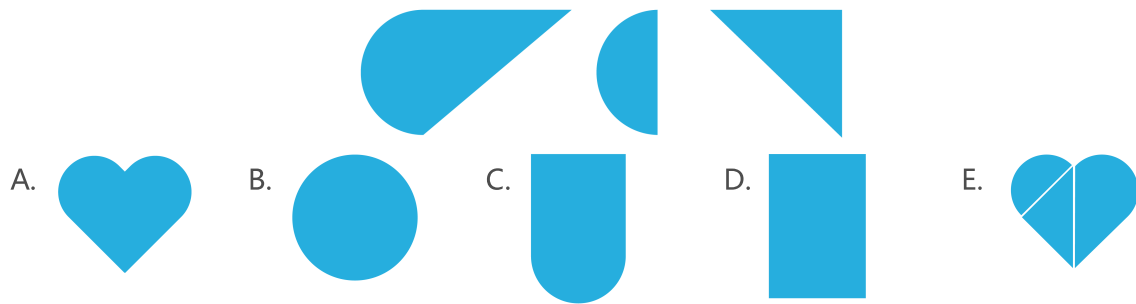
Answer E

Solution 【Answer】 E

【Resolution】 In this question if the two cards are in the same colour, then the rope should pass through in the same direction; otherwise the rope should pass through the opposite direction. So the correct answer is E.

- 13 A figure has been cut into 3 pieces as below. Which figure could have been cut?

(US 2019 Math kangaroo Problems, Level 1-2, Question #18)



Answer A

Solution



【Answer】 A

【Resolution】 Through observation, if we put together the three parts given in the question, we can get a heart-shaped pattern. So the correct answer is A.

14 Here are nine squares: . First, Ani replaced all the black squares with white ones. Next, Bob replaced all the gray squares with black ones. Finally, Chris replaced all the white squares with gray ones. What did they get at the end? (2019 Math Kangaroo Problem, Level 1-2, Question #22)

- A. 
- B. 
- C. 
- D. 
- E. 

Answer B

Solution We need to make the changes in order. At first, the strip looks like this:



After Ani makes all the black squares into white squares, it looks like this:



After Bob makes all the gray squares into black squares, it looks like this:



After Chris makes all the white squares into gray squares, it looks like this:



This is the final answer.

- 15 Peter chose a square of four cells in the table below so that the sum of the four numbers inside the square is greater than 63. Which of the following numbers must be in the chosen square?

(US 2019 Math kangaroo Problems, Level 1-2, Question #23)

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

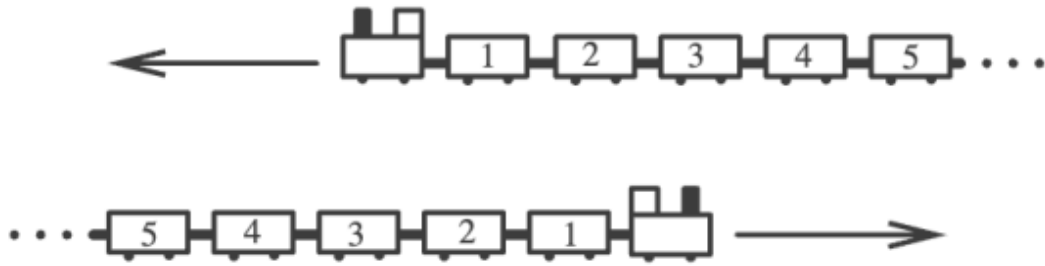
- A. 14 B. 15 C. 17 D. 18 E. 20

Answer A

Solution 【Answer】 A

【Resolution】 After calculation, we can frame two sets of numbers: $13 + 14 + 18 + 19 = 64$ and $14 + 15 + 19 + 20 = 68$. Both sets of numbers include 14. So we choose A.

- 16 Two identical trains, each with 31 cars, are traveling in opposite directions. When car number 19 of one train is opposite car number 19 of the other, which car is opposite car number 12? (MK 2020 Grades 1-2 Problem 18)



- A. 7 B. 12 C. 21 D. 26 E. 31

Answer D

Solution The two trains are moving in opposite directions. Car 12 is 7 cars away from car 19. This means that when cars 19 are aligned, car 12 will be opposite of $19 + 7 = 26$.

- 17 Mark the Bee can walk only on gray cells. In how many ways can you color exactly two white cells gray so that Mark can walk from A to B? (MK 2020 Grades 1-2 Problem 19)



- A. 3 B. 4 C. 5 D. 6 E. 7

Answer C

Solution Mark's path can be drawn in five ways, as illustrated below.



- 18 John and Olivia exchanged sweets. First, John gave Olivia as many sweets as Olivia had. Then Olivia gave John as many sweets as John had after the first exchange. After these two exchanges, each had 4 sweets. How many sweets did John have at the beginning? (

MK 2020 Grades 1-2 Problem 24)

A. 6

B. 5

C. 4

D. 3

E. 2

Answer B

Solution For this kind of problem, we can work backwards. Since John and Olivia each end up with 4 sweets, we know that there are 8 sweets total.



Right before this, Olivia gave John as many sweets as he had, so the number of his sweets just doubled. That means that he only had half of 4 sweets, which is 2 sweets, and Olivia had 2 more sweets, which is 6.



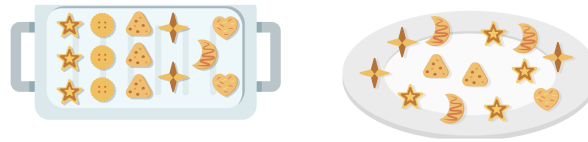
In the first exchange, right before the situation shown above, John gave Olivia as many sweets as she had, which means that the number of her sweets doubled. This means that she started out with half of 6, which is 3, and John had $3 + 2 = 5$ sweets.



19 Each participant in a cooking contest baked one tray of cookies like the one shown.

What is the smallest number of trays of cookies needed to make the following plate?

(US 2021 Math kangaroo Problems, Level 1-2, Question #23)



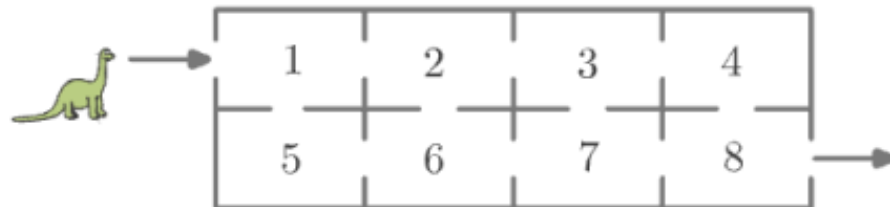
- A. 1 B. 2 C. 3 D. 4 E. 5

Answer C

Solution 【Answer】 C

【Resolution】 Among the cookies baked by each participant, the number of moon cookies is the least. Each participant has only one moon cookie, and it can be assumed that one moon cookie corresponds to one participant. There are 3 moon cookies in the goal plate which means there needs to be at least 3 participants, and then verify the other patterns. 3 participants can satisfy the question. The answer is C.

- 20 Dino moves from the entrance to the exit by going through rooms. He can only go through each room once.



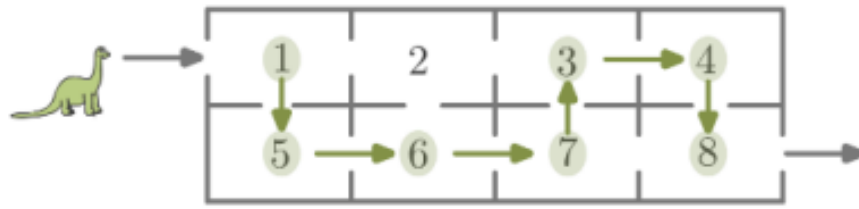
Dino adds up the numbers as he passes through each room. What is the highest total Dino can make? (MK 2022 Grades 1 and 2 Problem 20)

- A. 27 B. 29 C. 32 D. 34 E. 36

Answer D

Solution Dino can't go through all eight rooms and come out at the exit, but he can go through seven rooms. To get the highest total, the room he skips needs to have as small a number as possible. He has to go through 1, as that is where he comes in,

but he can skip 2 and go through all the other rooms. So, Dino goes through rooms $1 - 5 - 6 - 7 - 3 - 4 - 8$. This gives him a total of $1 + 5 + 6 + 7 + 3 + 4 + 8 = 34$.



- 21 Three frogs live in a pond. Each night, one of the frogs sing n song to the other two. After 9 nights, one of the frogs had sung 2 times. Another frog had listened to 5 songs. How many songs had the third frog listened to?

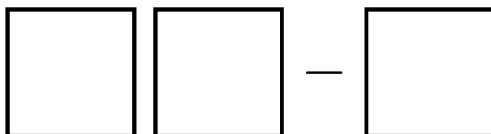
A. 7 B. 6 C. 5 D. 4 E. 3

Answer B

Solution Resolution: According to the question, it can be known that the first frog sang twice, the second frog listened to 5 songs, indicating that the second frog sang $9 - 5 = 4$ (songs), so the third frog listened to $2 + 4 = 6$ (songs), so the answer is B.

解析：根据题意可知，第一只青蛙唱了2次，第二只青蛙听了5首，说明第二只青蛙唱了 $9 - 5 = 4$ （首），所以第三只青蛙听了 $2 + 4 = 6$ （首），所以答案是B。

- 22 Digits 1, 1, 2 and 3 are printed on four different cards. Three cards are laid out to make a subtraction, as shown in the picture. How many different results can be obtained?



A. 6 B. 8 C. 10 D. 12 E. 24

Answer C

Solution

Resolution: Enumerating can be obtained: $11-2=9$, $11-3=8$, $12-1=11$, $12-3=9$, $13-1=12$, $13-2=11$, $21-1=20$, $21-3=18$, $23-1=22$, $31-1=30$, $31-2=29$, $32-1=31$. There are a total of 10 kinds, so the answer is C.

解析：枚举可得：

$11-2=9$, $11-3=8$, $12-1=11$, $12-3=9$, $13-1=12$, $13-2=11$, $21-1=20$, $21-3=18$, $23-1=22$, $31-1=30$, $31-2=29$, $32-1=31$ 共10种，所以答案为C。

- 23 Andrew was throwing darts at a target. He started with 10 darts and got 2 new darts each time he hit the target. In total, Andrew threw 20 darts and then had no darts left. How many times did Andrew hit the target?

A. 4 B. 5 C. 6 D. 8 E. 10

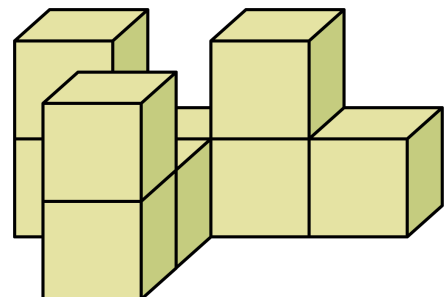
Answer B

Solution $20 - 10 = 10$, $10 \div 2 = 5$. Answer is B.

Mock Test Questions

4 points

- 24 Observing the cubes below from the left, how many squares can you see?



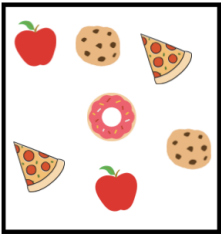
A. 9 B. 4 C. 6 D. 5 E. 3

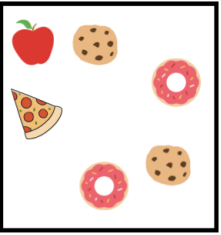
Answer D

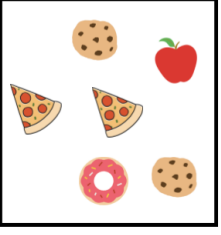
Solution

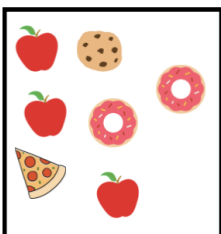
25 Anna has organized her snacks into 5 baskets. Each snack has a different cost, and all the baskets should add up to the same total. However, one of the baskets has a different total amount. Can you help Anna figure out which basket has a different total?

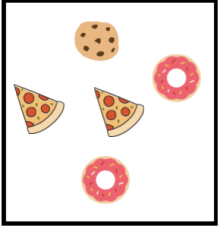


A. 

C. 

E. 

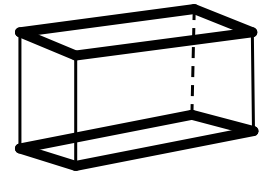
B. 

D. 

Answer E

Solution Observe and add every box, Every option equals to 16, but E equals to 15.

Lily is decorating a gift box by wrapping a ribbon around a box that is 150 centimeters long, 30 centimeters wide, and 60 centimeters high, as shown by the two black lines in the figure. How long is the ribbon?



A. 360cm

B. 720cm

C. 125cm

D. 960cm

Answer B

Solution $(150 + 30) \times 4 = 720\text{cm}$

- 27 Eddie and others are planting trees in a garden, following the order of 1 willow tree, 2 coconut trees, and 2 pine trees. A total of 32 trees were planted. How many coconut trees were planted?



A. 10

B. 13

C. 20

D. 14

E. 22

Answer B

Solution Each cycle consists of 1 willow tree, 2 coconut trees, and 2 pine trees, so each cycle plants 5 trees.

$32 \div 5 = 6$ full cycles with a remainder of 2 trees.

$6 \times 2 = 12$ coconut trees are planted.

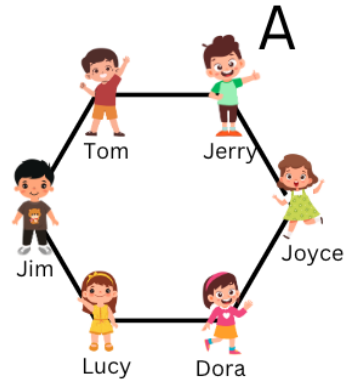
Now, consider the remaining 2 trees. According to the planting sequence, the first 1 tree will be a willow tree, and the second one will be a coconut tree.

Thus, 1 more coconut tree will be planted with the remaining trees.

Therefore, the total number of coconut trees planted is:

$$12+1=13 \text{ coconut trees}$$

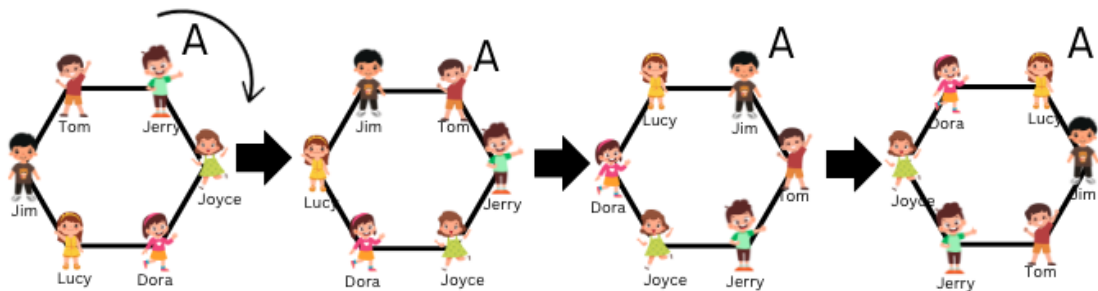
- 28 Six kids are running around a hexagon in a clockwise direction. After running three laps, who will be at corner A?



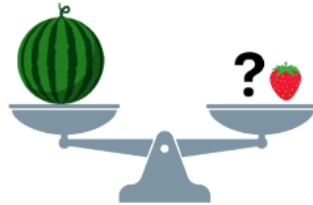
- A. Joyce B. Jerry C. Tom D. Jim E. Lucy

Answer E

Solution



- 29 According to the following scales, how many strawberries do we need on the right side in order to make the scale balance?



A. 12

B. 18

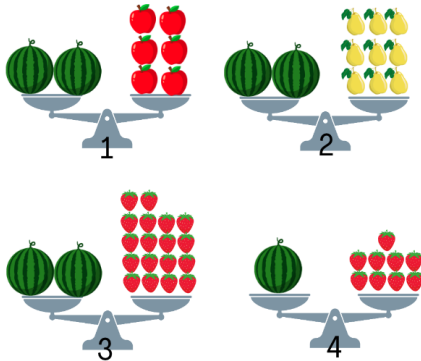
C. 7

D. 9

E. 5

Answer D

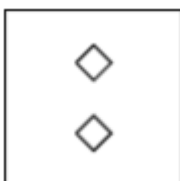
Solution



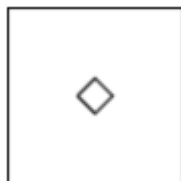
30 Which is the result of unfolding the paper?



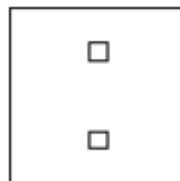
A.



B.

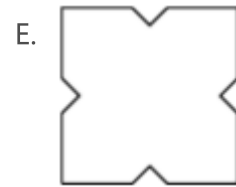


C.



D.



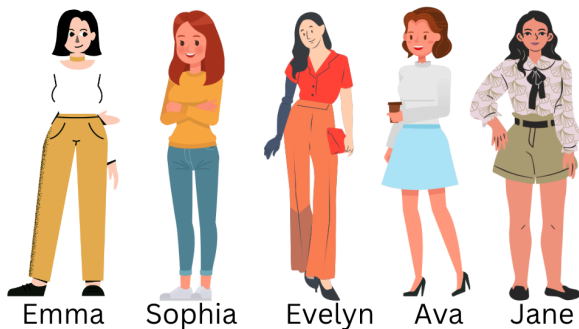


Answer A

Solution

31 There are five ladies standing outside the school. One of them is Mia's mom. We know that Mia's mom

- (1) doesn't wear a skirt
- (2) has long hair
- (3) doesn't have a purse



Which of them is Mia's mom?

- A. Emma
- B. Sophia
- C. Evelyn
- D. Ava
- E. Jane

Answer B

Solution (1) doesn't wear a skirt - eliminate Jane and Ava

(2) has long hair - eliminate Emma

(3) doesn't have a purse - eliminate Evelyn

Nancy needs to choose 2 round buttons and 1 square button from the buttons below.
How many different choices are there?

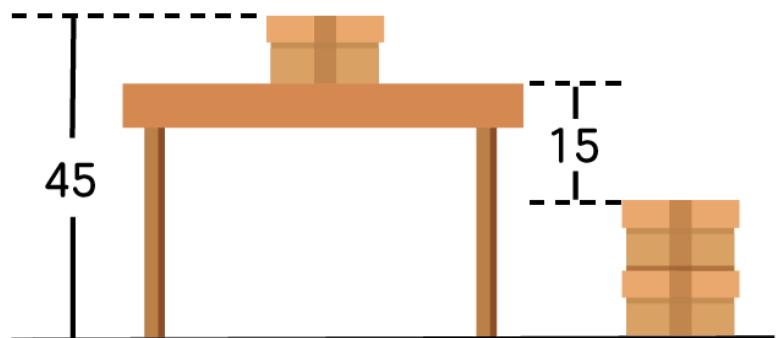


- A. 3 B. 4 C. 5 D. 6 E. 8

Answer D

Solution The square buttons are numbered *A* and *B*, and the round buttons are numbered 1, 2, 3. All possible choices are *A12*, *A13*, *A23*, *B12*, *B13*, and *B23*. Therefore there are 6 different choices.

33 There are 3 boxes of the same size placed on and beside the table as shown below.
What is the height of the table?

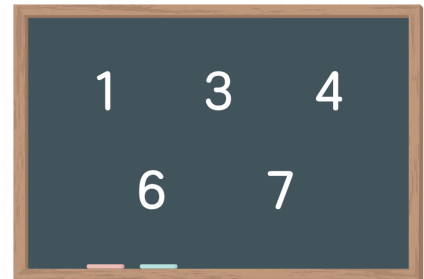


- A. 10 B. 15 C. 20 D. 30 E. 35

Answer E

Solution $45 - 15 = 30$, $30 = 10 + 10 + 10$. The height of the box is 10. The height of the table is $45 - 10 = 35$.

34 John wants to pick two numbers from the board and add them together. How many different results could he get?



A. 5

B. 6

C. 7

D. 8

E. 10

Answer D

Solution Enumerate in order:

$$1 + 3 = 4$$

$$1 + 4 = 5$$

$$1 + 6 = 7$$

$$1 + 7 = 8$$

$$3 + 4 = 7$$

$$3 + 6 = 9$$

$$3 + 7 = 10$$

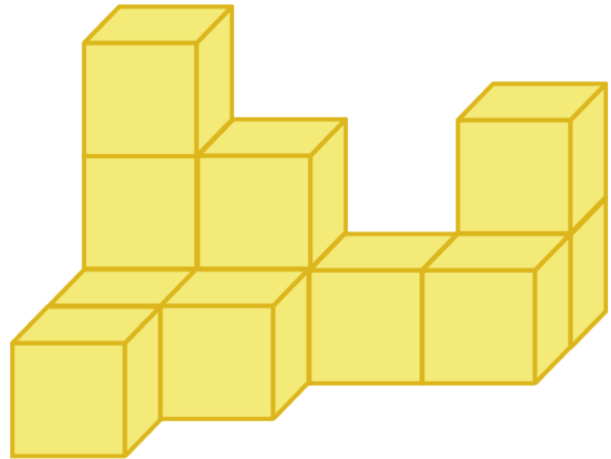
$$4 + 6 = 10$$

$$4 + 7 = 11$$

$$6 + 7 = 13$$

Note to remove the equations with the same result, there should be 8 different results. The answer is **D**.

Thomas made the shape shown using 12 cubes. He put one drop of glue between any two cubes that share a common face. How many drops of glue did he use?



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

Answer E

Solution By observation, it can be seen that 13 pairs of faces are glued in the figure, so 13 drops of glue are needed.

5 points

36 Eddie uses the cards below to practice addition. Each time, he draws three cards simultaneously and put them into a group and record. There are how many different possible combination of numbers?



- A. 7 B. 8 C. 9 D. 10 E. 11

Answer D

Solution Possible Combination : $1 + 2 + 3 = 6$, $1 + 2 + 4 = 7$, $1 + 2 + 5 = 8$, $1 + 3 + 4 = 8$,
 $1 + 3 + 5 = 9$, $1 + 4 + 5 = 10$, $2 + 3 + 4 = 9$, $2 + 3 + 5 = 10$, $2 + 4 + 5 = 11$,
 $3 + 4 + 5 = 12$ There are 10 groups of number.

- 37 Daisy, Lily, and Tom each have 3 different outfits. For each outfit that Brian has, at least two other children have that same outfit as well.

Which combination of outfits does Brian wear today?



- A.   
- B.   
- C.   
- D.   
- E.   

Answer E

Solution Daisy and Lily have  in common.

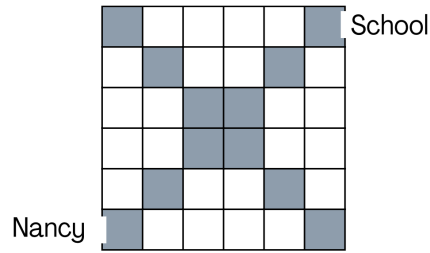
Lily and Tom have  in common.

Daisy and Tom have  in common.

Therefore, Brian should have the outfit:    The answer is E.

- 38 Nancy wants to move through the map to go to school. She can only move to the right ($\rightarrow$) or upwards ($\uparrow$). Each time she visits a gray box, she has to pay 3 dollars. Each time

she visits a white box, she has to pay 1 dollar. How much would she pay for the cheapest path?



- A. 20 dollars B. 19 dollars C. 18 dollars D. 17 dollars E. 16 dollars

Answer D

Solution According to the conditions, Nancy has to pass through 11 boxes in total. In order to pay as little money as possible, she should pass through as few gray boxes as possible. After trial and error, she still needs to pass through 3 gray boxes. So Zara needs to pay at least $1 \times 8 + 3 \times 2 = 17$ dollars. The answer is D.

- 39 Julia has a list of problems to finish during May. She starts on the 1st of May, which this year is a Wednesday. If she solves exactly 5 problems each day, she will finish the task on a Thursday. If she solves exactly 3 problems each day, she will finish the task on a Wednesday. How many problems are on the list?



- A. 6 B. 12 C. 24 D. 45 E. 66

Answer D

Solution If Julia solves 5 problems every day, she might finish the problems on the 2th, 9th, 16th, 23th, and 30th corresponding to 10, 45, 80, 115, 150 problems respectively; If Julia solves 3 problems every day, she might finish the problems on the 8th, 15th, 22nd, 29th, corresponding to 24, 45, 66, 87 problems respectively. Based on the above analysis, there are a total of 45 problems. The answer is D.

- 40 A frog wants to smell the lotus in the pond. He can only move upward or to the right. What is the greatest sum of the numbers along the path?

3	4	1	7
2	1	5	2
3	8	3	6
1	9	4	1

- A. 13 B. 35 C. 42 D. 36 E. 31

Answer D

Solution

3	4	1	7
2	1	5	2
3	8	3	6
1	9	4	1

$$1 + 9 + 8 + 3 + 6 + 2 + 7 = 36$$

- 41 Place the digits 1, 2, 3, 4, and 5 in the squares to create the largest possible three-digit number and calculate the sum. To make the sum greatest, what should the three-digit number be?

$$\square\square\square + \square\square$$

- A. 542 B. 531 C. 123 D. 521 E. 572

Answer A

Solution

$$\begin{array}{r} \begin{array}{|c|c|c|} \hline 5 & 3 & 1 \\ \hline \end{array} \\ + \begin{array}{|c|c|} \hline 4 & 2 \\ \hline \end{array} \\ \hline 5 \quad 7 \quad 3 \end{array} \quad \begin{array}{r} \begin{array}{|c|c|c|} \hline 5 & 4 & 2 \\ \hline \end{array} \\ + \begin{array}{|c|c|} \hline 3 & 1 \\ \hline \end{array} \\ \hline 5 \quad 7 \quad 3 \end{array}$$

- 42 Charlotte picks mushrooms for 4 days. Each day, she picks 3 more than the previous one. On day 4, she picks ten times the number of mushrooms she picked on the first day. How many mushrooms did she pick in total over 4 days?

- A. 1 B. 22 C. 15 D. 10 E. 18

Answer B

Solution Day 1: $9 \div (10 - 1) = 1$

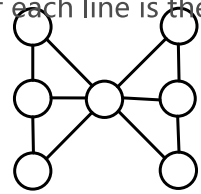
Day 2: $1 + 3 = 4$

Day 3: $4 + 3 = 7$

Day 4: $7 + 3 = 10$

$1 + 4 + 7 + 10 = 22$

- 43 Input the numbers 1, 2, 3, 4, 5, 6 and 7 into the circles so that the sum of each line is the same. What is the sum of each line?



- A. 4 B. 12 C. 10 D. 8 E. 15

Answer B

Solution

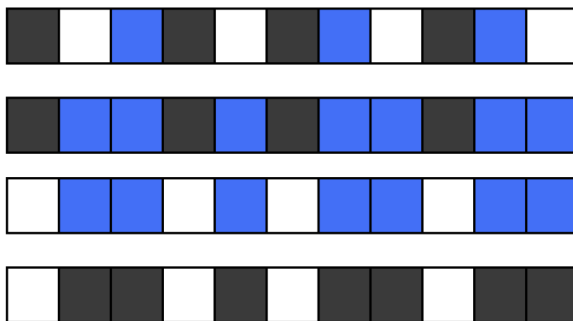
- 44 Here are 11 squares. First, Stacy replaced all the white squares with blue ones. Next, Jerry replaced all the black squares with white ones. Finally, Louis replaced all the blue squares with black ones. What did they get at the end?



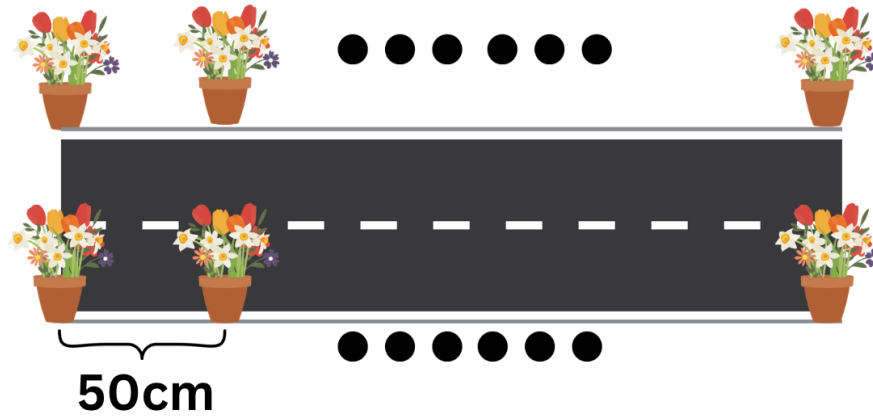
- A.  B. 
- C.  D. 
- E. 

Answer B

Solution



Kathy wants to decorate both sides of the road in front of her home. On each side, she places a pot of flowers every 50 cm. In total, she uses 20 pots of flowers. How long is the road?



- A. 450cm B. 500cm C. 1000cm D. 950cm E. 1050cm

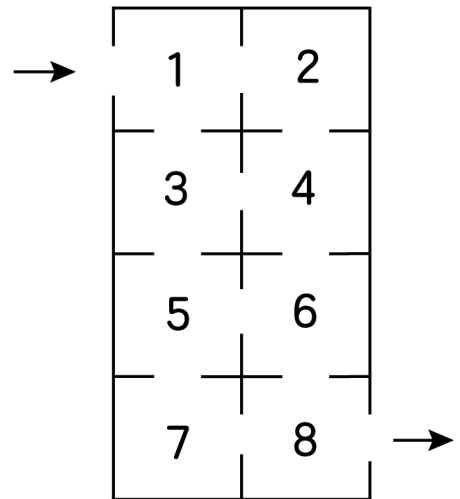
Answer A

Solution $20 \div 2 = 10$

There are 10 pots of flowers on each side.

$$50 \times 9 = 450\text{cm}$$

- 46 Dino moves from the entrance to the exit by going through some rooms. He can only go through each room once. Dino adds up the numbers as he passes through each room. What is the largest result Dino can get?



A. 27

B. 29

C. 32

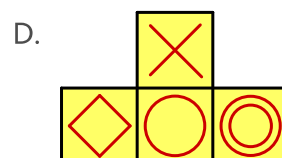
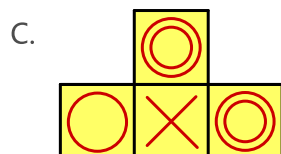
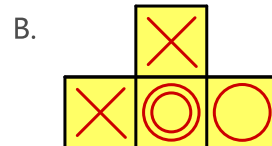
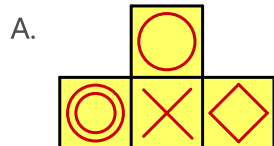
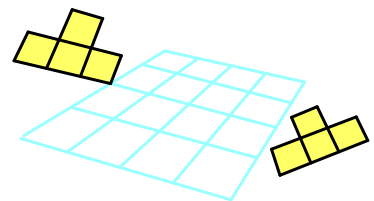
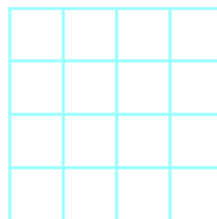
D. 34

E. 36

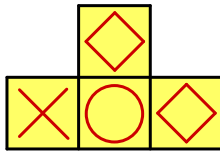
Answer D

Solution Dino can go through 7 rooms at most. The room he can avoid with the least number is 2. The highest total he can make is $1 + 3 + 4 + 5 + 6 + 7 + 8 = 34$.

- 47 Choose 4 pieces from the options to fill in the grid, ensuring that each shape appears exactly once in every row and column. Which piece is left out?



E.



Answer B

Solution Each piece has the "x" shape. The formed figure can have at most four "x" shapes.

Option *B* has two "x" shapes, so it cannot be used.

48 There are some cats and 10 dogs, each of them is white or orange. There are three more cats than the total number of orange animals. There are 6 white dogs. How many white cats are there?

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

Answer D

Solution Orange dogs: $10 - 6 = 4$;

White cats: $4 + 3 = 7$.

49 Tom and Emma exchanged marbles. First, Tom gave Emma as many marbles as Emma had. Then Emma gave Tom as many marbles as Tom had after the first exchange. After these two exchanges, each had 8 marbles. How many marbles did Emma have at the beginning?

- A. 6 B. 8 C. 10 D. 12 E. 16

Answer A

Solution $8 + 4 = 12$, $12 - 6 = 6$

50 Alice, Bob, Charlie, and Diana went to a pet store to buy different pets. They stood in line, one after another. Each of them bought a different pet: a dog, a cat, a bird, and a fish. We know that:

- (1) The last person did not buy the dog or the bird.
- (2) Charlie was not first in line, and he bought the fish.
- (3) Alice, who was standing behind Charlie and in front of Bob, did not buy the bird.

Which of the following is true?

- A. Diana was last in line.
- B. Bob bought the bird.
- C. Charlie was third in line.
- D. Alice bought the dog.
- E. Diana bought the cat.

Answer D

Solution Diana was first in line, and he bought the bird;
Charlie was second in line, and he bought the fish;
Alice was third in line, and she bought the dog;
Bob was last in line, and he bought the cat.