



5 Types of Thinking Strategies Drill

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5 Types of Thinking Strategies



People think and solve problems when we run into challenges in everyday life or when asked to make decisions. Sony Global Education is leading the way to developing new approaches to problem solving through a focus on “thinking strategies” and classifies thinking strategies into five major categories named “5 Types of Thinking Strategies.”

This “5 Types of Thinking Strategies Drill” includes five unique approaches to needed to solve each problem.

By learning and grasping which thinking strategies can be used to solve each problem, it will lead to the development of thinking ability.

◆ Features of each Thinking Strategies



Scan

Scan ‘Reading what’s necessary’

Detectives first investigate every aspect of the crime scene in order to come up with a perfect deduction — is the door locked? Is anything suspicious lying on the floor? Similarly, ‘Scan’ is an approach where you read elements that are necessary from the question or diagram.



Create

Create ‘Finding inspiration’

It’s interesting how the images of things around you completely change if you look at them from the front, side, and above. Similarly, you may find an unexpected solution if you look at the question or task from different perspectives — this is the ‘Create’ approach.



Reverse

Reverse ‘Following the path backward’

When finding your way through a maze, it’s most efficient if you follow the path backward from Finish to Start, rather than blindly finding your way out. Similarly, ‘Reverse’ is an approach where you imagine the solved problem then sort out the possible processes.



Knock

Knock ‘Clarifying the possibilities’

When you need to use the bathroom, you may knock on stall doors one by one to find an empty room. Similarly, ‘Knock’ is an approach where you clarify every single possibility without overlaps.




























Step

Step ‘Building your thoughts’

You climb up the stairs one step at a time. If one of the steps is missing, you can’t reach the end. Similarly, ‘Step’ is an approach where you build the steps correctly one by one to reach the goal of problem-solving.

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Explanation 35-69

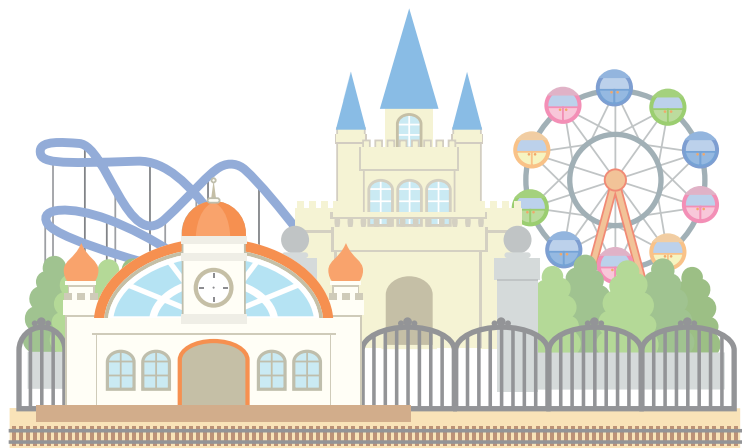
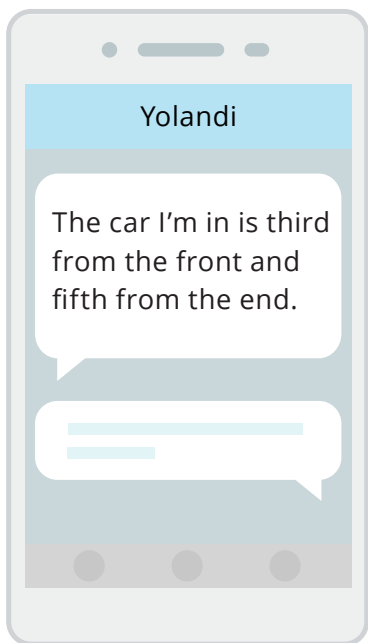
01

Meeting Point

Types of Thinking Strategies



Mina and Yolandi are going to an amusement park together. They plan to meet up in the train that goes to the amusement park. Mina gets to the train first, from the station closest to her home. Then she texted Yolandi who is at the next station waiting for the train to come.



How many cars does the train have?

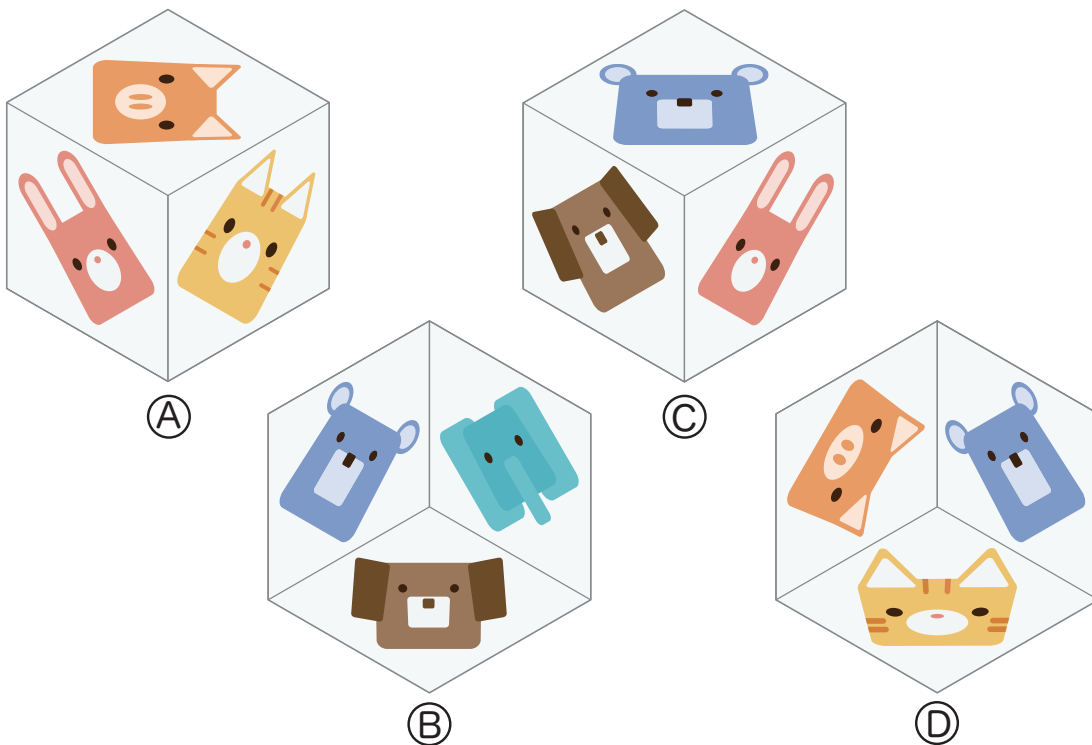
 Answer

02

Animal Dice

Types of Thinking
Strategies

Here are 4 dice with 6 different animals drawn on each one.
Three are pictures of the same dice. Which one is the different dice?



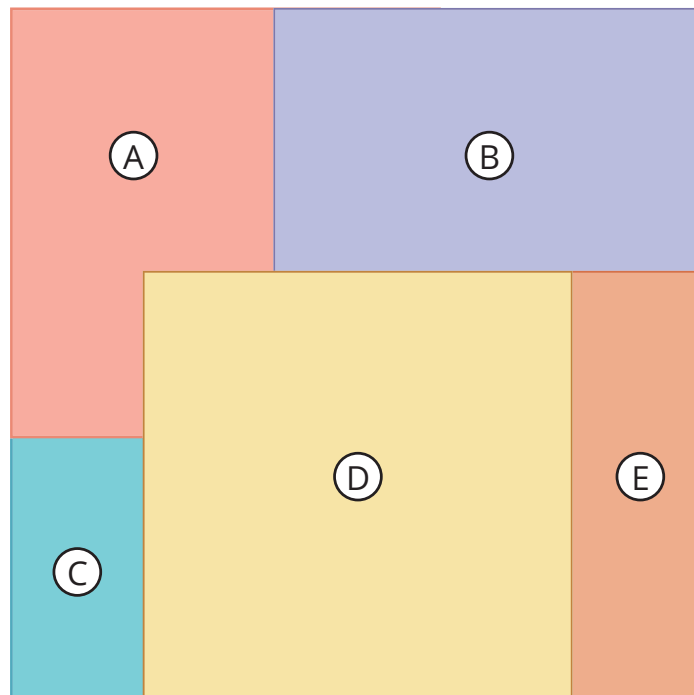
 Answer

03

Square Origami

Types of Thinking
Strategies

There are five square pieces of paper of the same size, labeled A to E. They were placed on top of each other as shown below. Which one was placed at the bottom?



 Answer

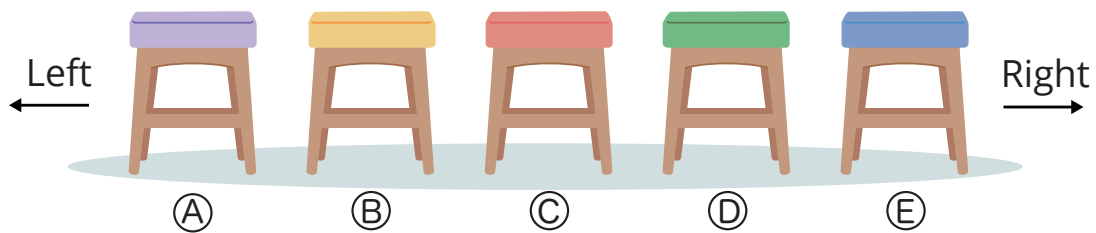
04

Where is Kenny?

Types of Thinking Strategies



Find Kenny's seat.



Kenny sits two seats away from me.



Maria

Brent sits next to me, on my left.



Tony

My seat is (B).



Anna

Kenny does not sit next to me.



Brent

Answer

05

Three Chairs

Types of Thinking Strategies



These three chairs belong to Dan, Chloe and Tim.



My chair is not placed at one of the ends.



Dan

I did not place my chair at the left end.



Chloe

Mine is not next to Chloe's.



Tim

Who's chair is at the left end?

 Answer

06

A Snack for Today

Types of Thinking
Strategies

Phil, Stu and Alan were thinking about what snacks they were going to have today. After a while, their mother came back from shopping with some snacks.

Donuts! Right?



Phil

I say, a cake or donuts.



Stu

I don't think she bought us cookies...



Alan

Some of you got it right, and some of you got it wrong. I bought one of a cake, donuts, or cookies.



Mom



What was their snack for today?

 Answer

07

Make Them Fit

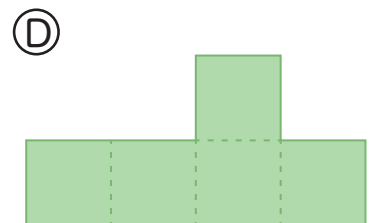
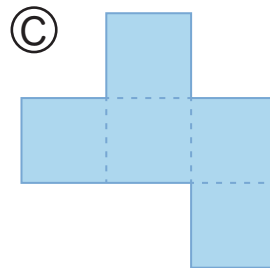
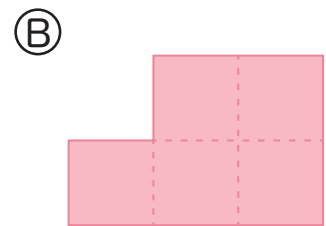
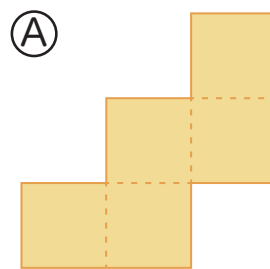
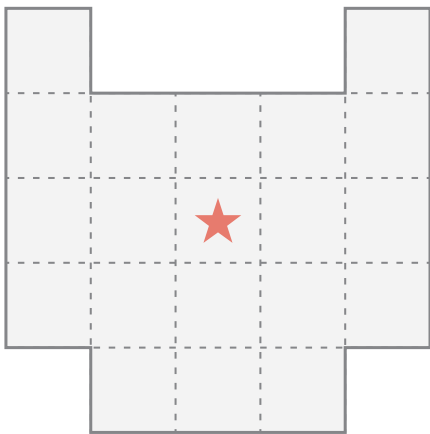
Types of Thinking Strategies



Use the 4 pieces A to D to form the shape pictured below.

You can turn the pieces around but cannot flip them.

Which piece lands on ★ ?



 Answer

08

Glass Sheets

Types of Thinking

Strategies



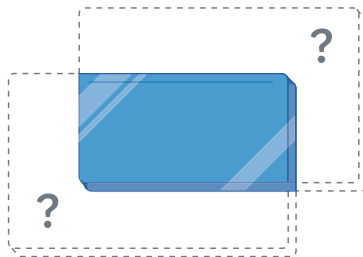
There were six sheets of glass, two each of three kinds: blue, yellow and clear.

When a blue sheet and a yellow sheet overlap each other, they look green.



Sora, Ron and Luca picked two sheets each and had them overlap.

Sora saw blue, Ron saw yellow, and Luca saw green.



What color of glass sheets did Sora have?

 Answer

09

Cards from 1 to 5

Types of Thinking Strategies



There are five cards numbered .

Hannah arranged them face down in a line, and Marnie guessed their order.



Marnie

How many cards are greater than one, on the left side of ?

Two.



Hannah



Marnie

How many cards are greater than two, on the right side of ?

One.



Hannah



Marnie

What do you get if you add every number on the right side of ?

7.



Hannah



Marnie

Got it!

Read their conversation carefully.

What is the number that Hannah placed at the end of the right side?

 Answer

10

Out to lunch

Types of Thinking Strategies



Alyssa, Bridget, Connor and Dylan are having lunch at a nice restaurant. They sit at the square table shown below.

Bridget and I always sit next to each other.



Alyssa

Connor does not sit in front of me.

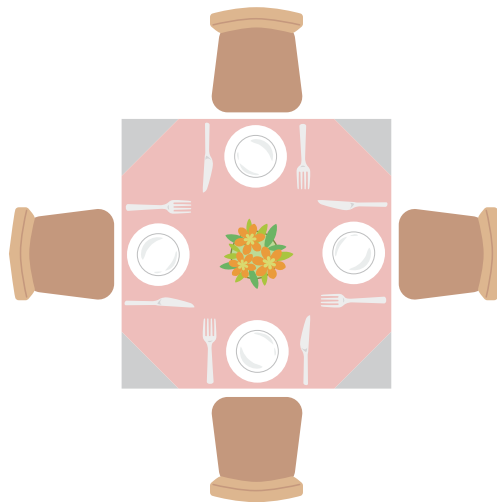


Bridget

Dylan sits on my right side.



Connor



Who sits on Bridget's right side?

Answer

11



Chocolate Gifts











Types of Thinking Strategies



Each package contains a different number of chocolates depending on the color.

Numbers at the left and bottom show how many chocolates each row or column has in total.

For example,  +  = 8 chocolates. Find the total number of the chocolates that fits in '?'.

4				
13				
13				
18				
	19	?	8	4

 Answer

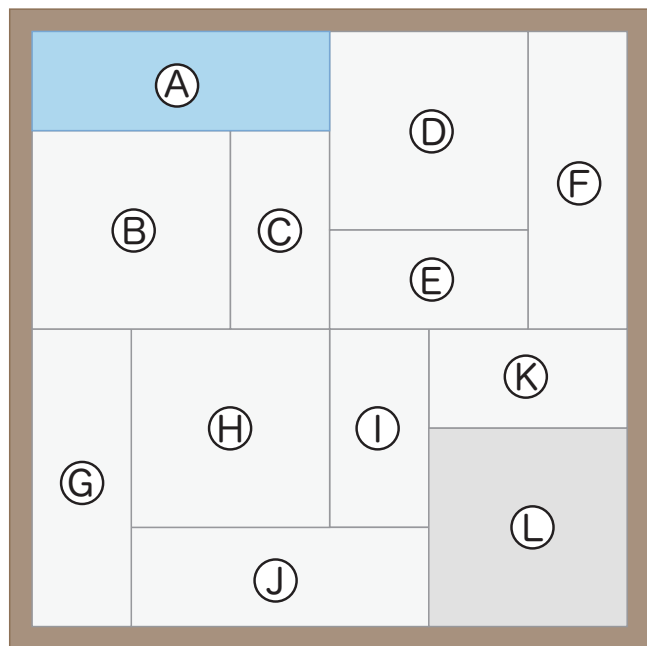
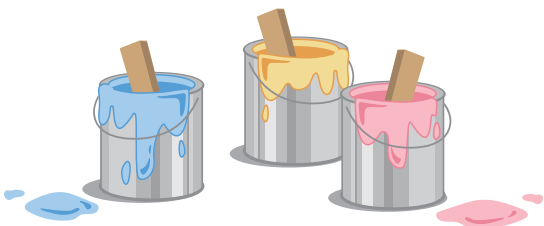
12

A Tricolor Puzzle

Types of Thinking
Strategies

Let's paint each tile from Ⓐ to Ⓛ using these 3 colors :
blue, yellow and pink. If you follow the rules below, which color will Ⓛ be?

1. Ⓐ is painted in blue.
2. The tiles that are next to each other should be painted in different colors.



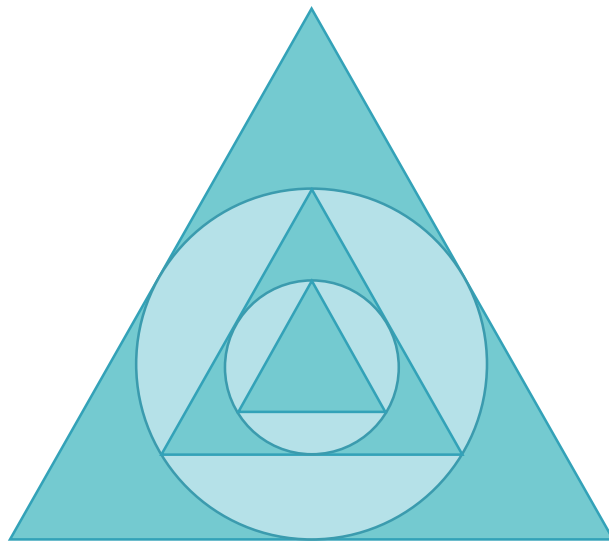
 Answer

13

Circles and Triangles

Types of Thinking
Strategies

How many times larger is the biggest triangle than the smallest triangle?



Answer

14

$$812 \times \square\square$$

Types of Thinking Strategies



Fill in the boxes below with the correct numbers.

What numbers fit in the red boxes?

$$\begin{array}{r}
 8 1 2 \\
 \times \square \square \\
 \hline
 \square \square \square \square \square \\
 \square \square \square \\
 \hline
 \square \square \square \square
 \end{array}$$



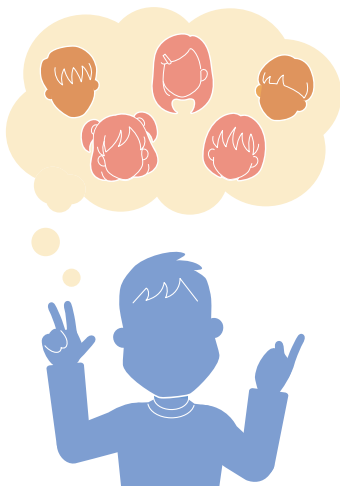
 Answer

15

Big Family

Types of Thinking
Strategies

There are 5 children in the Campbell family.



Mr. Campbell

Um, Seymour is older than Miranda,
and Franny is older than Toni.
We had two kids between Austin and
Miranda.
Toni is in the middle.
... Hey, do not call me a bad father.
I just have a terrible memory!

Who is the youngest among the Campbells, Seymour, Miranda, Toni, Franny or Austin?

 Answer

16

On the Beach

Types of Thinking Strategies



It's summer vacation!

Brian, Joanne, Tanya and Carlo went to the beach and had a swimming competition.



Brian

Tanya finished in last place.

Brian finished in 3rd place.



Joanne

Joanne was the champion!



Tanya

I finished 2nd...from last.



Carlo



The slowest couple felt too embarrassed to tell the truth.

The two fastest answered honestly.

In what place did Tanya finish?



Answer

17

The A. B. C. Neighbors

Types of Thinking
Strategies

Eight families whose names start from A to H live in the houses labeled as I, II, III, IV, V, VI, VII and VIII as shown below. Who lives in House III?

- Hint 1: E lives right across the street from A.
- Hint 2: C lives right across the street from F.
- Hint 3: F lives in between E and H.
- Hint 4: G lives in between C and B.
- Hint 5: D lives in House VIII.



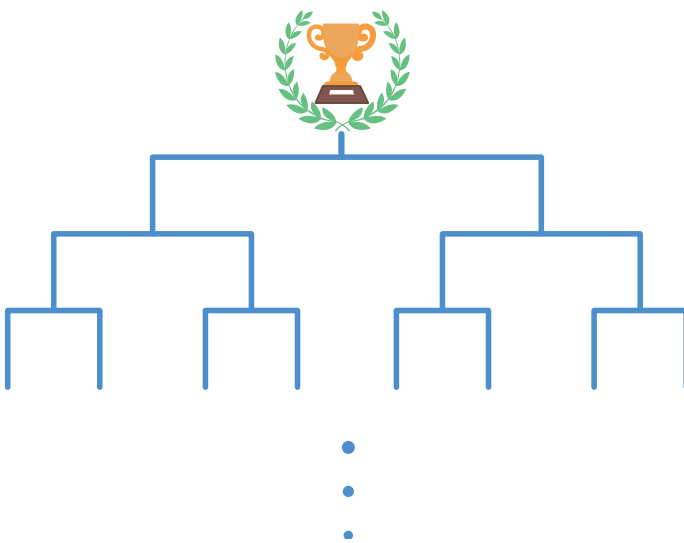
 Answer

18

Tennis Tournament

Types of Thinking
Strategies

100 people join a tennis tournament.
How many matches are there in total?



 Answer

19

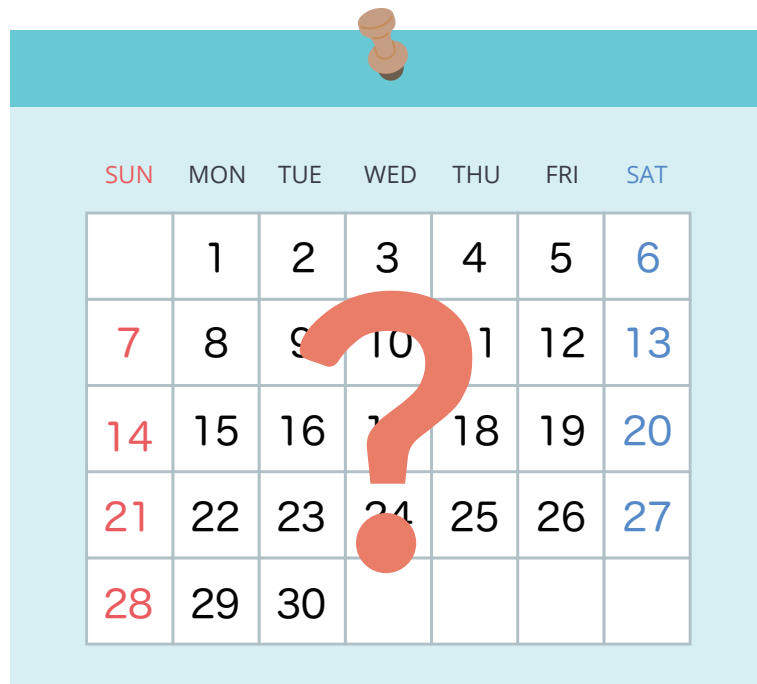
What's the date today?

Types of Thinking Strategies



Pete is 10 years old. Two days ago, he was 9 years old. He turns 11 years old this year.

With this in mind, what is today's date?



 Answer

20

Fibbers

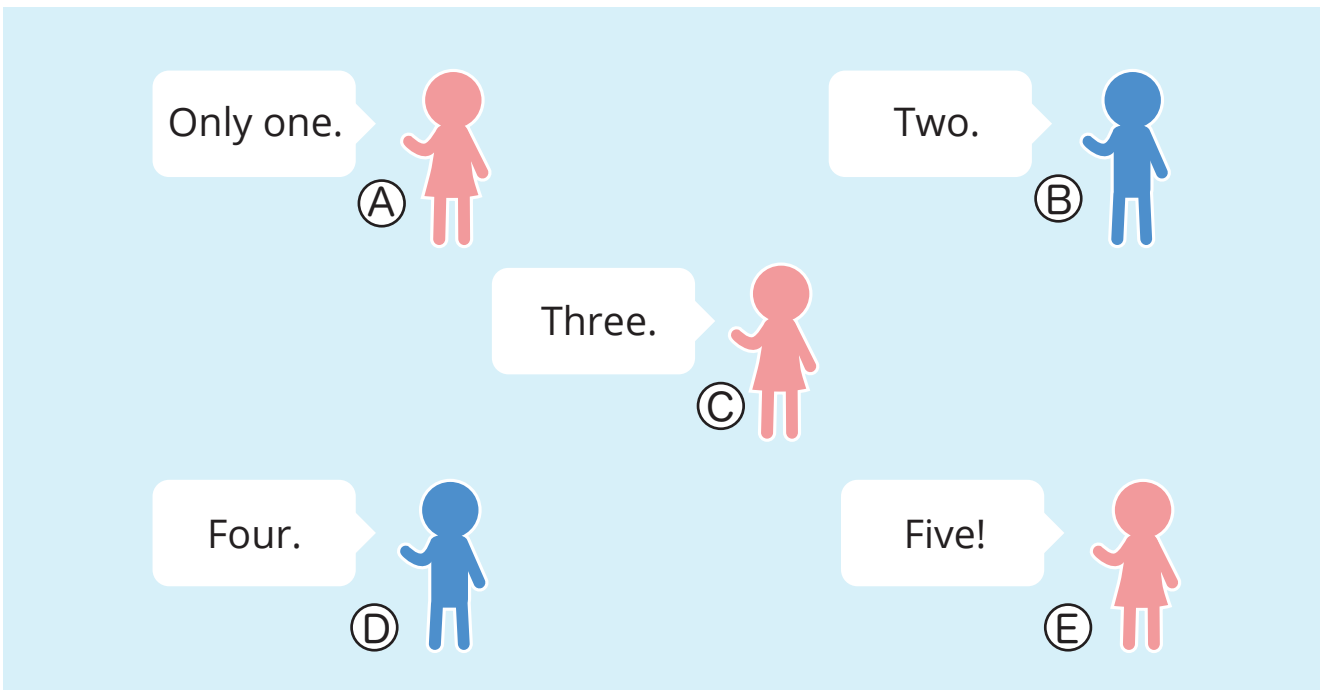
Types of Thinking Strategies



There are five people labeled (A), (B), (C), (D) & (E).

Some of them are fibbers who always tell fibs. When they were asked how many of them are fibbers, they answered as below.

How many of them are fibbing?



The diagram shows five people, labeled (A) through (E), each with a speech bubble indicating their answer to the question 'How many of them are fibbing?':

- (A) says: Only one.
- (B) says: Two.
- (C) says: Three.
- (D) says: Four.
- (E) says: Five!

 Answer

21

Let's Get Fit!

Types of Thinking Strategies



Ricki, Kitty, Simon, Tobias, Nana and Hadia love P.E. classes.

Today, they had a fitness test that consisted of six events: a 50-meter sprint, a softball throw, the long jump, side steps, endurance running and the jump rope.



Ricki

I was better than Kitty in five events.

I was better than Simon in five events.



Kitty



Simon

I was better than Tobias in five events.

I was better than Nana in five events.



Tobias



Nana

I was better than Hadia in five events.

I was better than Ricki in five events.



Hadia

Nana finished in 3rd place in the 50-meter sprint.

Who finished in 1st place in the 50-meter sprint?



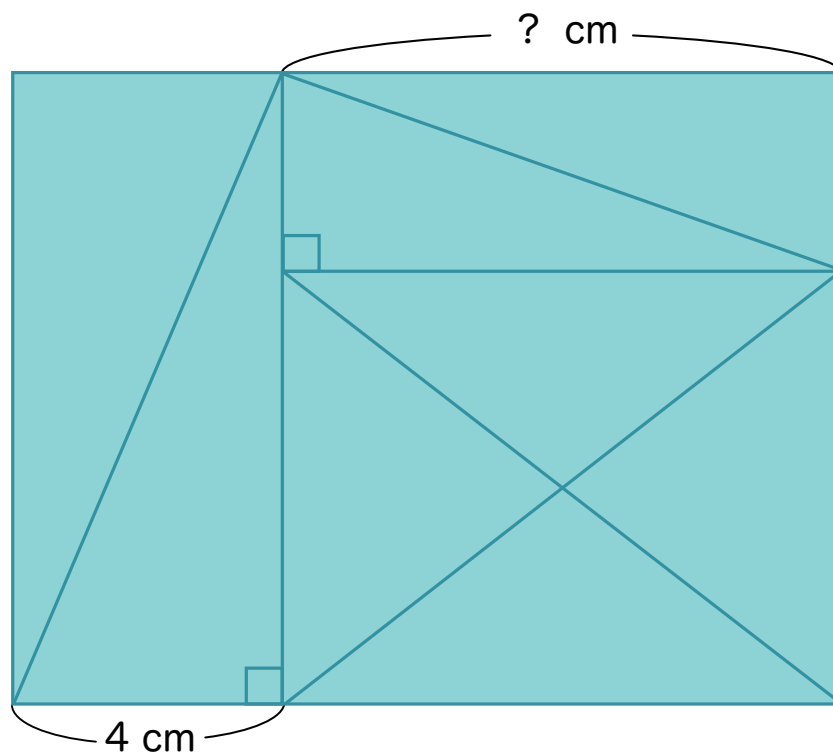
Answer

22

Clover Patch

Types of Thinking
Strategies

The rectangle below is divided into eight parts with the same area.
Find the length of ' ? ' in centimeters. The figure is not drawn to scale.





 Answer

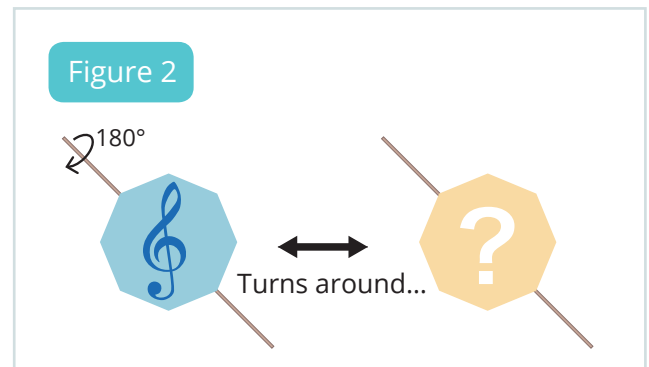
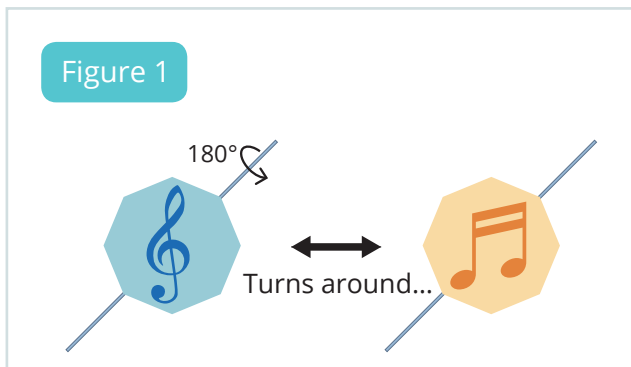
23

Rotating Card in the Wind

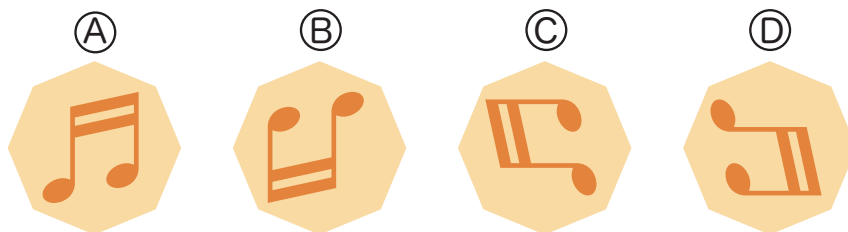
Types of Thinking Strategies



There is a card that rotates around an axis. You can see a  on one side and a  on the other side. Figure 1 shows the image when it rotates.



What image do you see if you move the axis as in Figure 2 and turn the card around? Choose from (A) to (D).



 Answer

24

True or False?

Types of Thinking
Strategies

Someone out of the group between Ian, Fiona, Nicholas, Ysabel, Gareth, and Megan came late to my music class. Whoever it is, be honest and raise your hand.



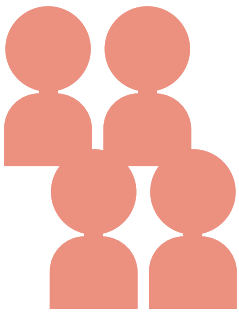
Mr. Chang

Well, it must be either Ian, Fiona or Gareth.

No, it is out of Ian, Nicholas or Ysabel.

That's not true. Fiona or Ysabel or Megan came late.

Believe me. It's either Ian, Nicholas or Gareth.



There is only one person telling the truth and three of the rest are lying. Who was the one late to the music class?

 Answer

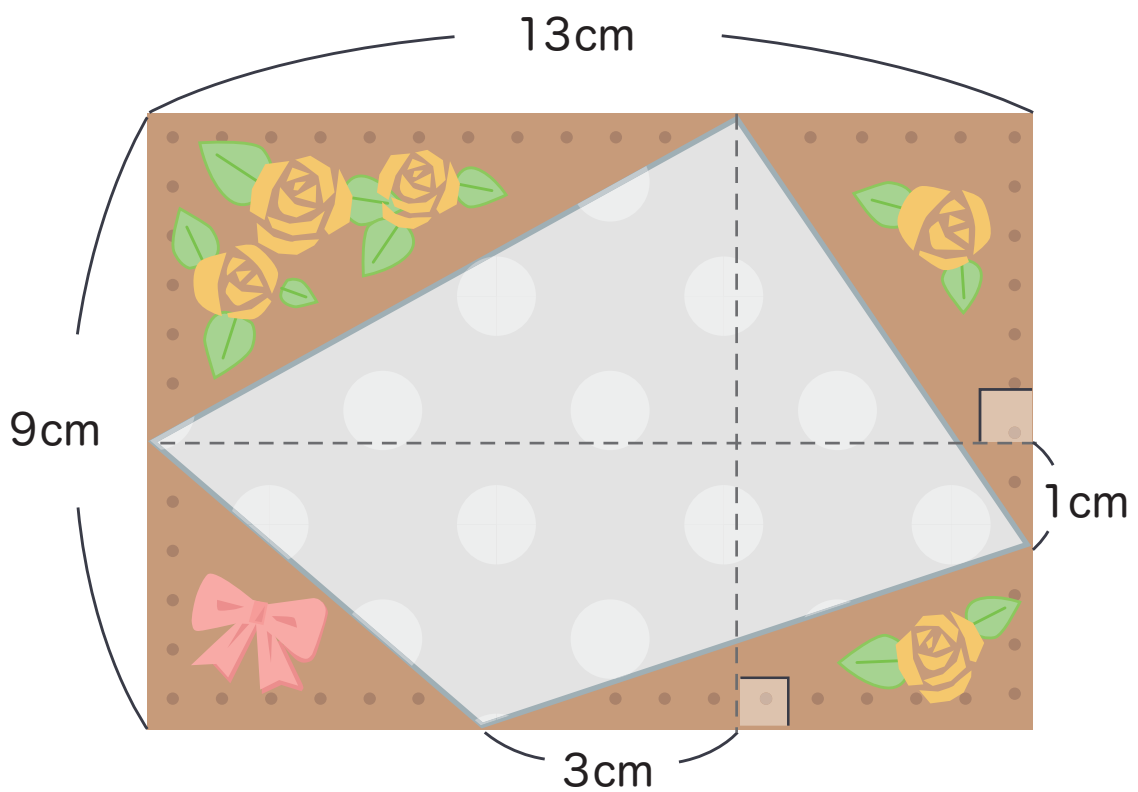
25

In The Frame

Types of Thinking
Strategies

Karen went shopping and got a cute floral photo frame. If you put a photo in it, you can see it in the spotted area.

What area of the photo is visible?



 Answer

26

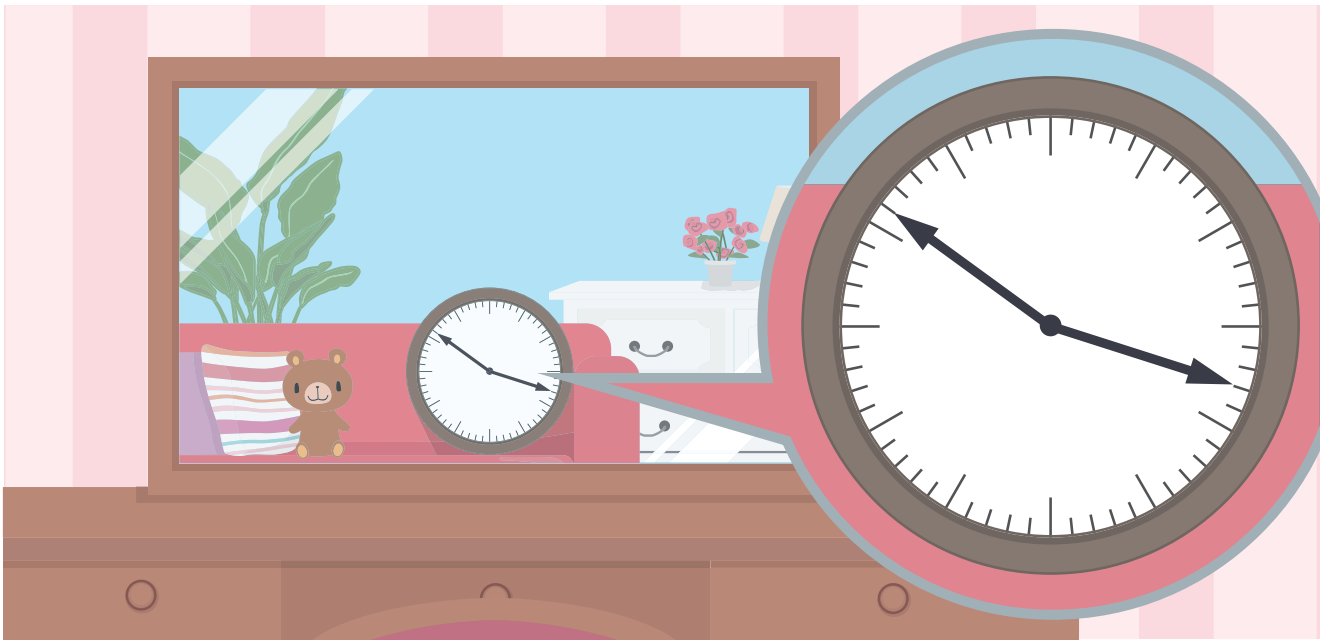
Clock in a Mirror

Types of Thinking
Strategies

Lucy was getting ready in her room one morning. Looking at the mirror, she saw that her clock fell off the wall and landed on the sofa. The picture below shows what she saw at that moment.

Her clock did not have any numbers on its face and its hands were the same size.

What time was it?



 Answer

27

Craft Time

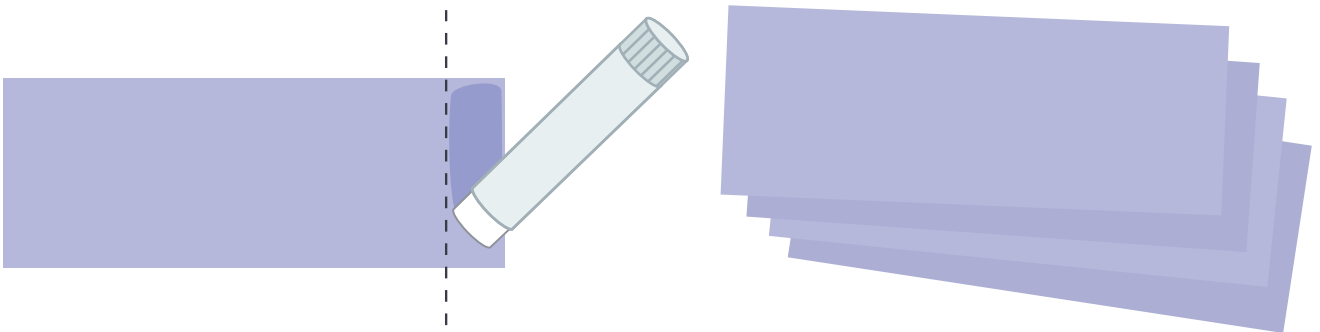
Types of Thinking
Strategies

There were five pieces of rectangular paper that had an area of 24 cm^2 each.

We made 1 cm margins around their edges and stuck them together to make a big sheet of paper. At first, we planned to paste their long sides together. However, we stuck their short sides together by mistake.

As a result, the area of the completed paper became 20 cm^2 larger than planned.

How long was the short side of the rectangle?



 Answer

28

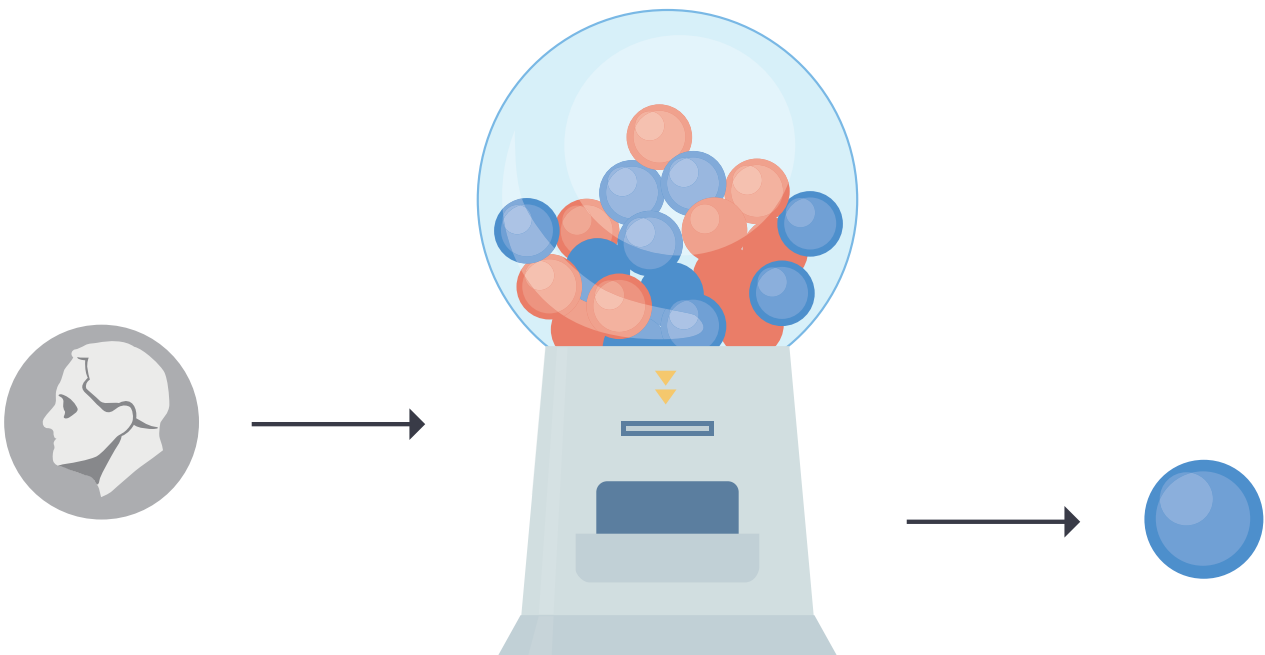
Marbles

Types of Thinking
Strategies

In this machine, there are 10 red and blue marbles each.

You need to spend 10¢ to get either a red or a blue marble.

How much do you have to spend to get three marbles of the same color?



 Answer

29

Sandwich Box

Types of Thinking
Strategies

This lunch box contains 8 sandwich triangles that are the same size.
What is the area of the empty square that is left in the center?

Figure 1

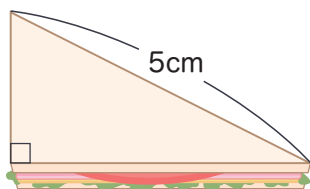
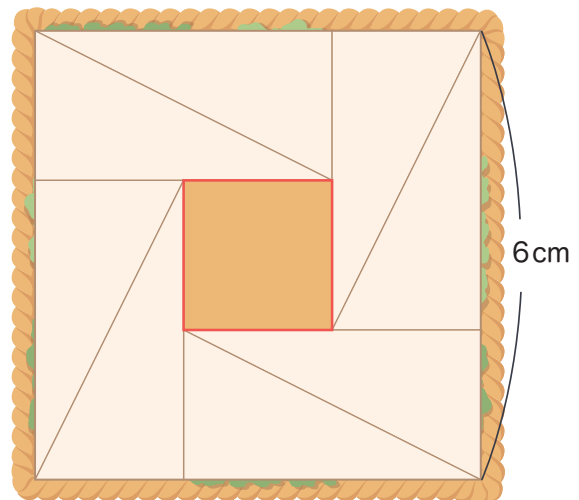


Figure 2



 Answer

30

Ball Sorting Machines

Types of Thinking

Strategies



There is a ball sorting machine as shown in Figure 1. When you throw balls into the top, they are sorted to the right and left like this: the first one comes out from the right, the second from the left, the third from the right, the fourth from the left... and so on.

Six of the same ball sorting machines are connected to make a bigger machine as shown in Figure 2. How many balls do you need to throw to get a ball from d?

Figure 1

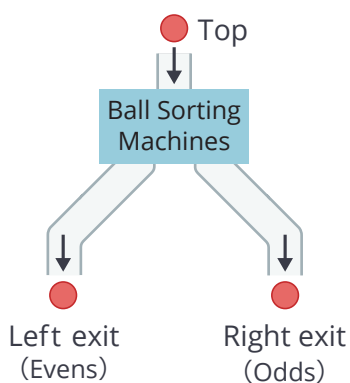
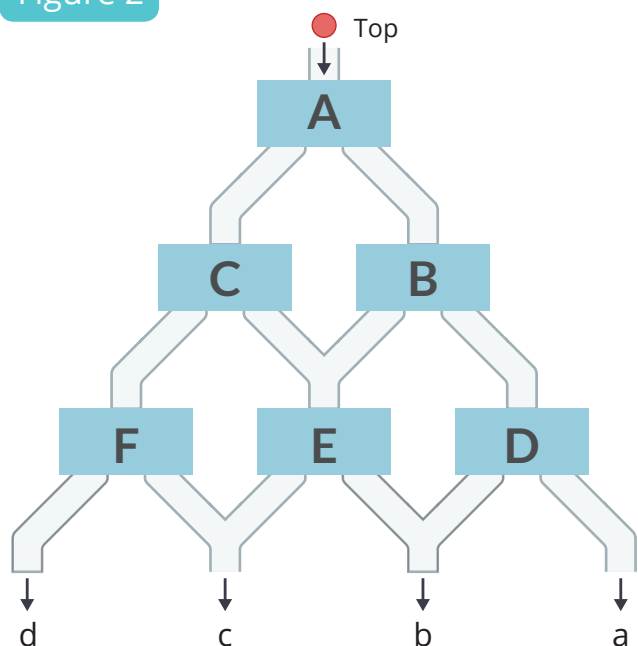


Figure 2



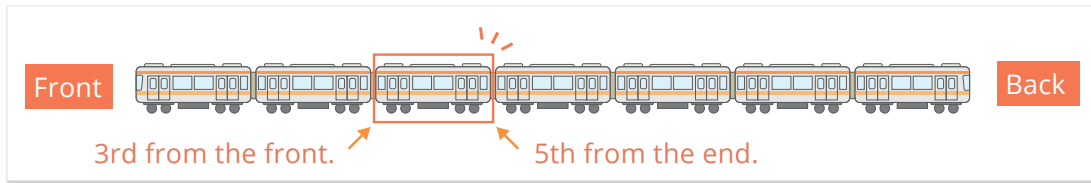
Answer

Answer and Explanation

01

Explanation Meeting Point

Did you think the answer is $3 + 5 = 8$ cars? Not this time!



So the answer is 7 cars.

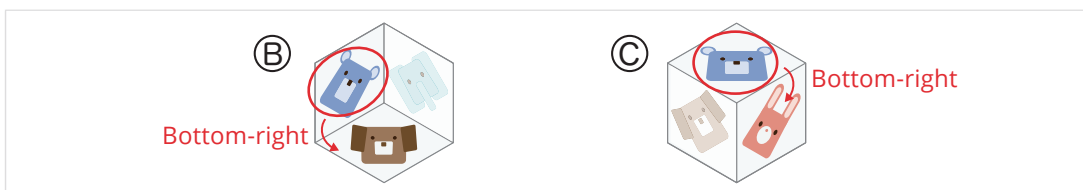
Answer

7 cars



02

Explanation Animal Dice



Look at





In B,  is on the bottom-right side of .

In C,  is on the bottom-right side of . B and C are different dice.



In C,  is on the bottom-left side of .

In D,  is on the bottom-left side of . C and D are different dice.

If B is the different one, C and D have to be the same.
If D is the different one, B and C have to be the same.

As there is only one different dice, the answer is C.

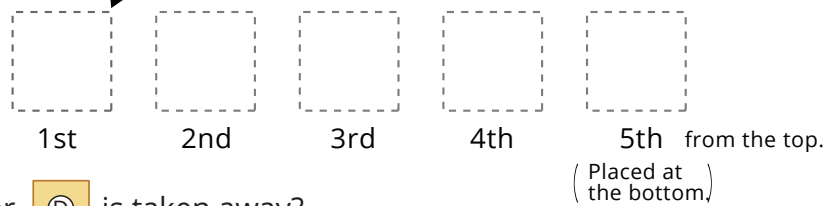
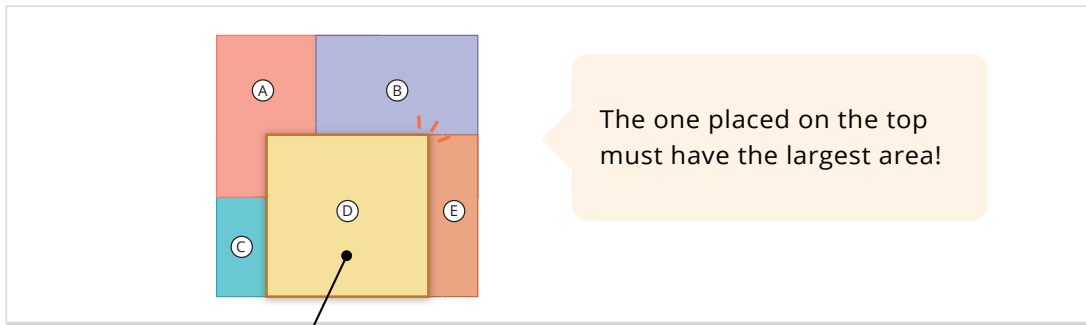
Answer

C

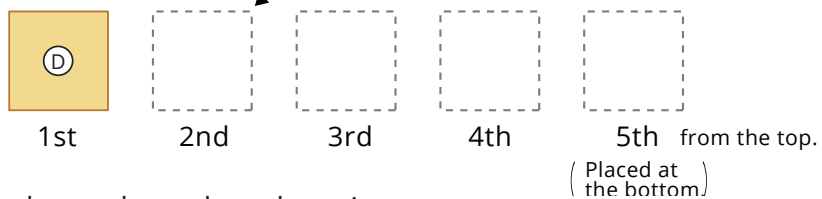
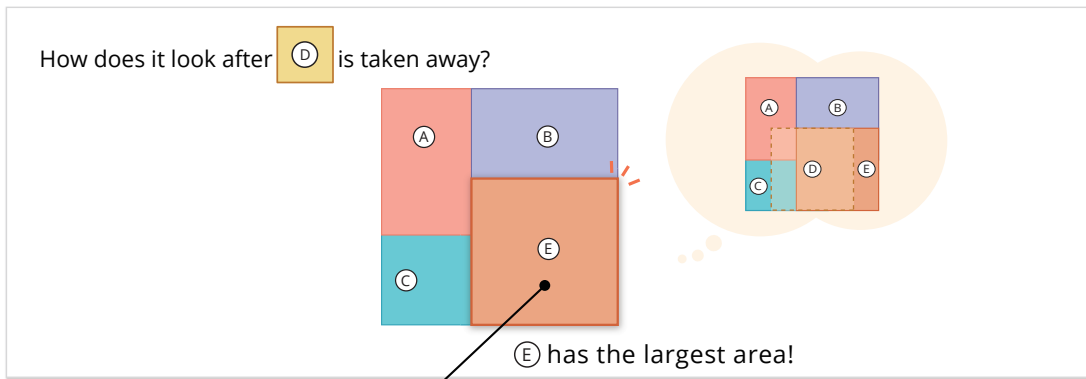
03

Explanation Square Origami

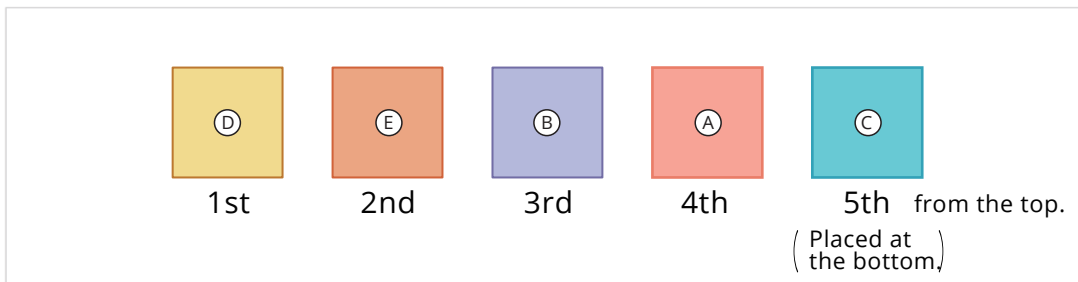
Let's remove the pieces of paper one by one.



How does it look after **D** is taken away?



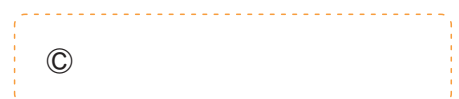
Likewise, you can find out where the other pieces are.



As you can see,

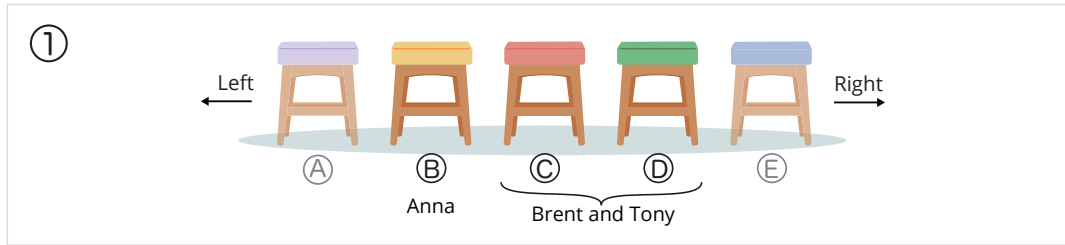
C is the one placed at the bottom.

答え

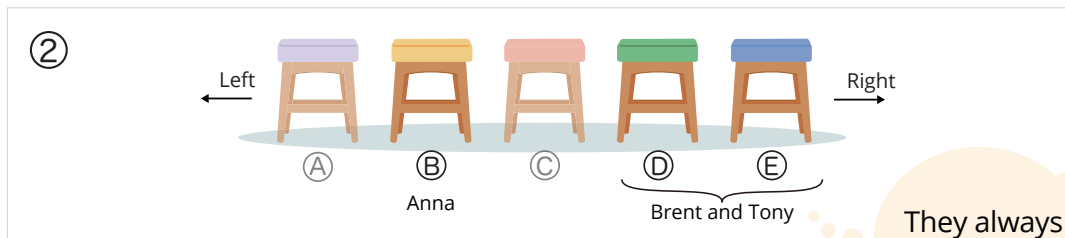


Carefully read what everyone says. Let's look at the simplest comment first.

According to Anna, she sits on ②.



or

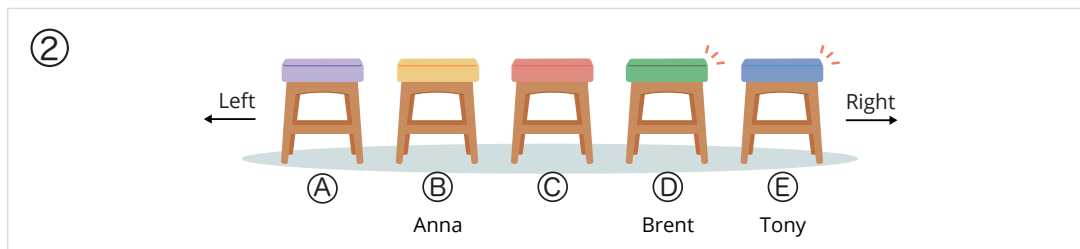


They always sit next to each other.

Let's check where Brent and Tony actually sit.

If ① is the case, Maria sits 4 seats away from Kenny - this does not fit what she says.

Therefore, Brent and Tony sit as in ②.



According to Brent, Kenny does not sit next to him - So Kenny does not sit on ③.

Now you see where everyone sits!



Kenny's seat is ①.

Answer


①

05

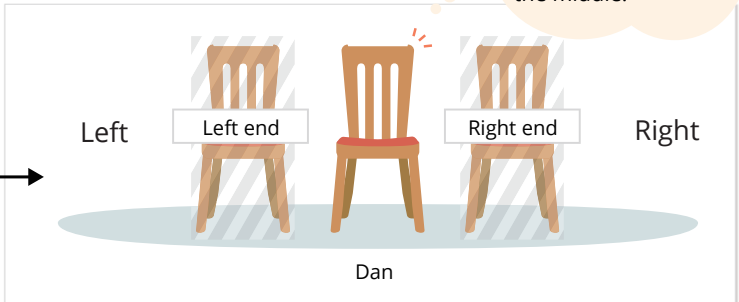
Explanation Three Chairs

Which chair is Dan's?

My chair is not placed at one of the ends.



Dan




Left Left end Right end Right

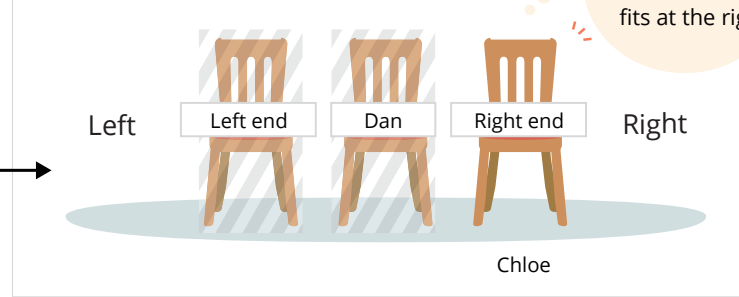
Dan

Which chair is Chloe's?

I did not place my chair at the left end.



Chloe




Left Left end Dan Right end Right

Chloe

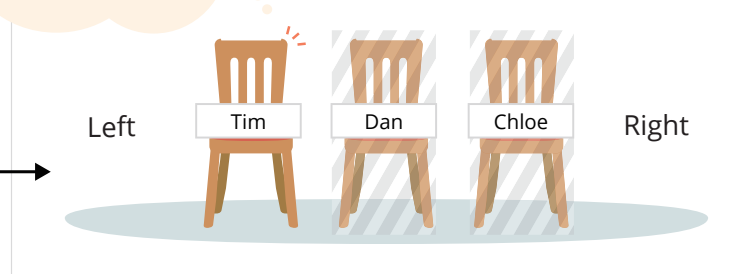
Which chair is Tim's?

Mine is not next to Chloe's.



Tim

Which one is left?
This one is definitely not next to Chloe's.



Left Tim Dan Chloe Right

As you can see, their chairs are placed as follows.


The chair at the left end is Tim's.

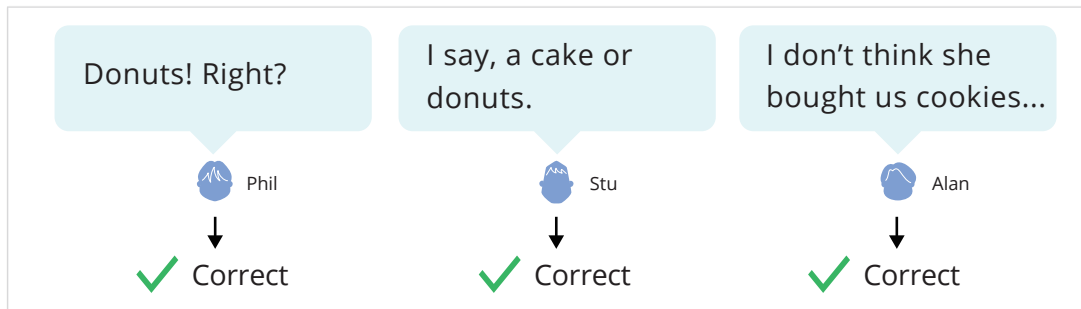
Answer

Tim

06


Explanation A Snack for Today

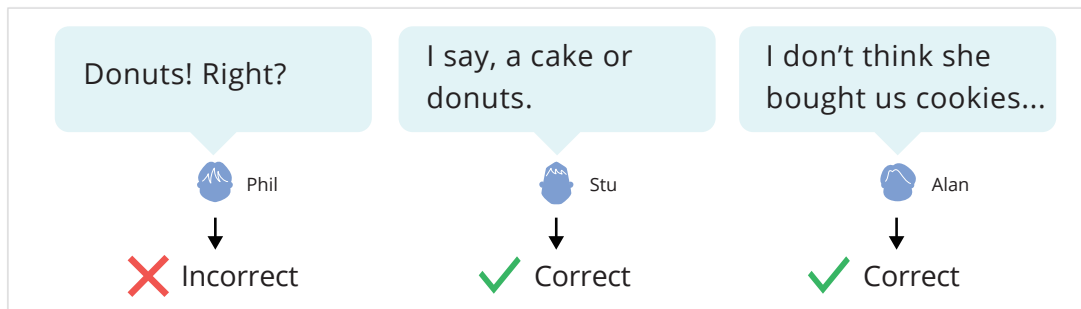
Assume that it was  Donuts.



What everyone said was correct.


That contradicts what their mother said.

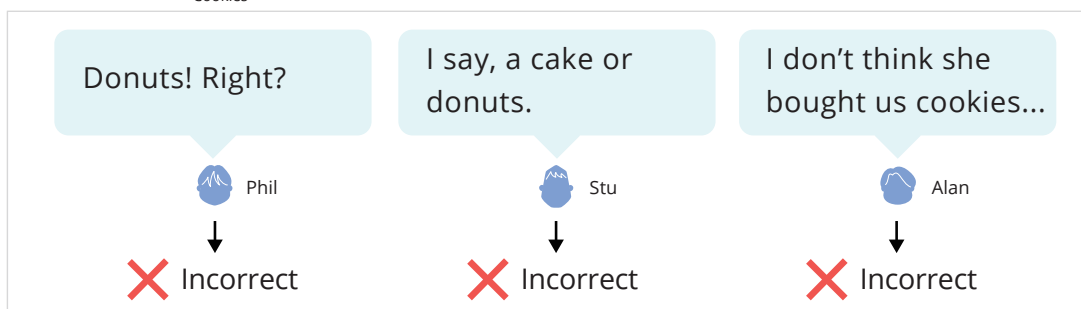
Assume that it was  Cake.



Phil got it wrong, but Stu and Alan got it right.

That goes along with what their mother said.


Assume that it was  Cookies.



No one made the right guess.

That contradicts what their mother said.

What their mother said makes sense only when she bought them a cake.

That means,  Cake was their snack for today!

Answer

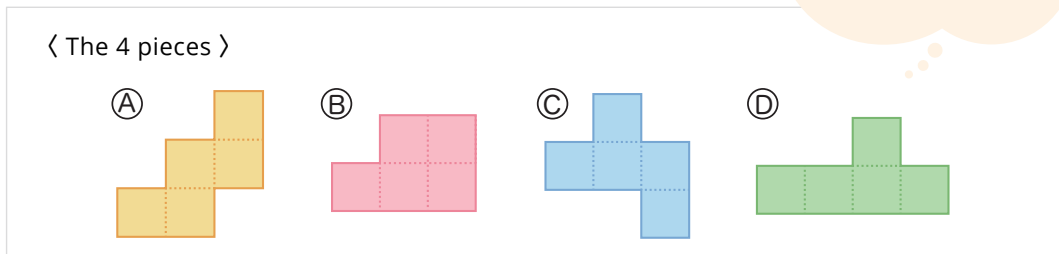
Cake

07

Explanation Make Them Fit

Let's think of how to place ④.

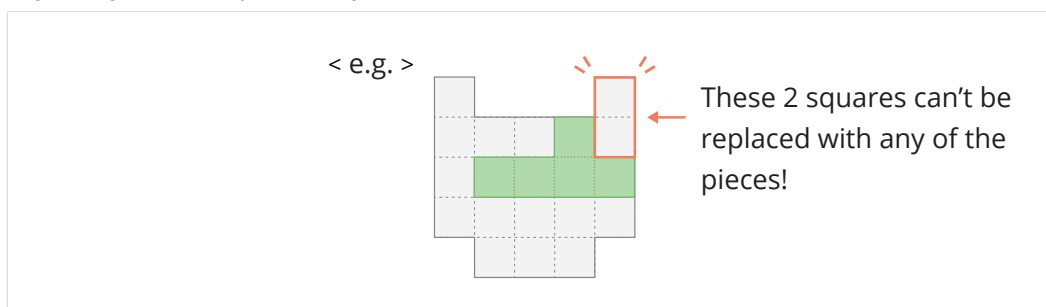
These four are all made of 5 squares.



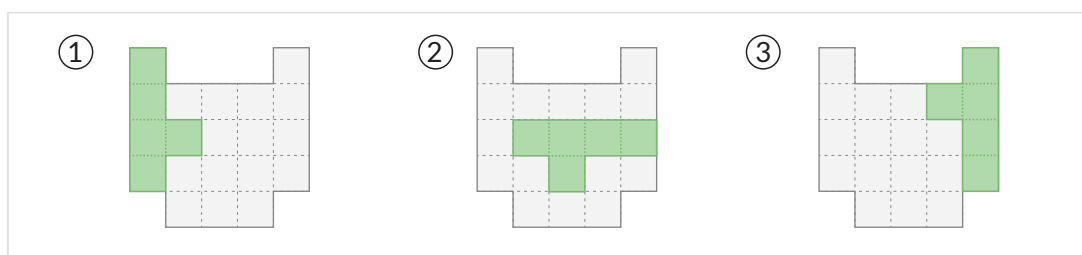
Place D in a way that the rest of the squares can be replaced with sets of 5 squares.

- 3 sets of 5 squares or
- 1 set of 5 squares and 1 set of 10 squares or
- 1 set of 15 squares

If you try another possibility...



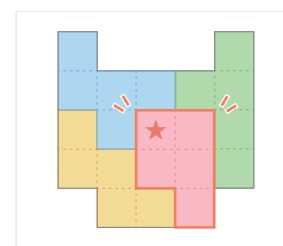
From Step I, you can see that there are 3 ways of placing ④.



Out of the three above, ③ is only one that the pieces A, B, and C can fit in neatly.

Let's place all the pieces now.

As you can see, the answer is ②.

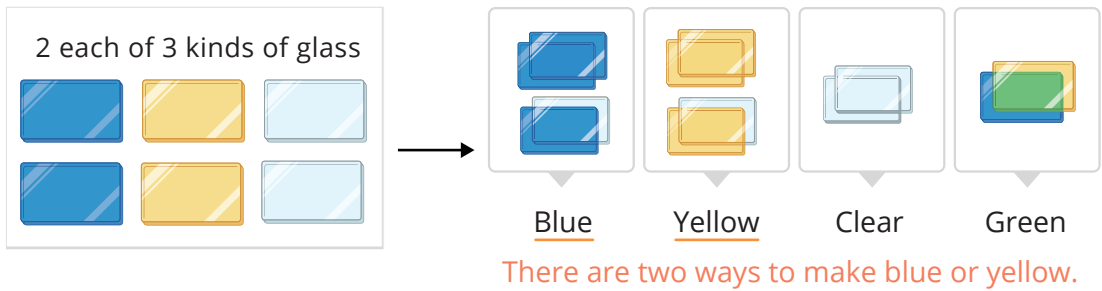


Answer

②

What colors can you make by putting two sheets on the top of each other?

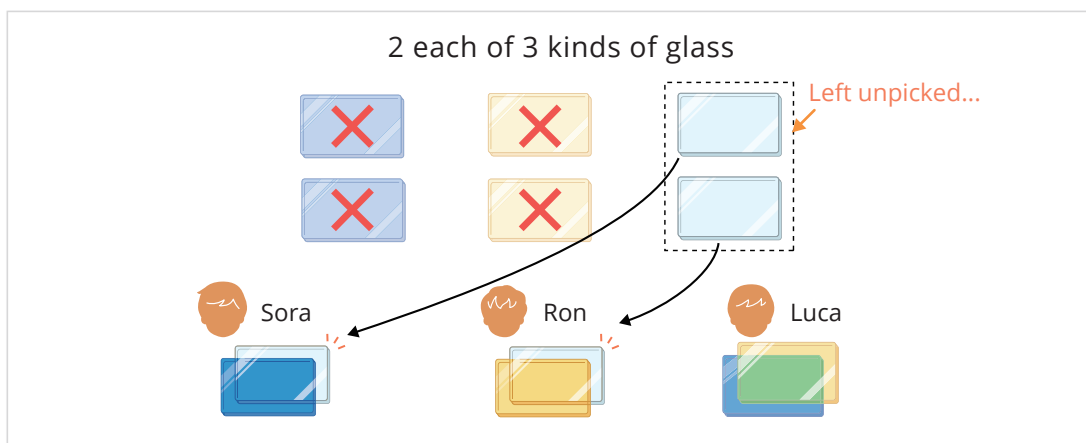
There were six sheets of glass, two each of three kinds: blue, yellow and clear.
 When a blue sheet and a yellow sheet overlap each other, they look green.



What color of glass sheets did they pick?

	They see...	They picked...
Sora		
Ron		
Luca		

Now, what colors of glass sheets are left?



The glass sheets that Sora had were blue and clear.

Answer

Blue and clear

What do you know from part 1?

Marnie: How many cards are greater than one, on the left side of 1?

Hannah: Two.

Numbers greater than one: 2, 3, 4, 5

Numbers smaller than 1: None

All the other cards are greater than 1

→ 1 fits in the position third from the left.



What do you know from part 2?

Marnie: How many cards are greater than two, on the right side of 2?

Hannah: One.

There is at least one card on the right

side of 2 - so it is not at the right end.



What if 2 is placed on the left side of 1?



The other cards 3 4 5 have numbers greater than two.



Only one card on the right side of 1 is greater than two.

2 cannot be placed at the left of 1.

2 only fits in the position second from the right!



Next Page

Marnie: What do you get if you add every number on the right side of 3?

Hannah: 7.

There are some cards on the right side of 3.

What if 3 is placed at the left end?

Marnie: The other cards are 4 & 5.

(Left) ~~3~~ ? 1 2 ? (Right)

$1+2+4+5=12$

Numbers on the right add up to 12. 3 is not placed at the left end.

3 is placed at the second from the left.

(Left) ~~3~~ 3 1 2 ~~3~~ (Right)

The numbers on the right side of 3 add up to 7.

(Left) ? 3 1 2 4 (Right)

add up to 7.

4 is at the right end!

Hannah put 4 at the far right side.

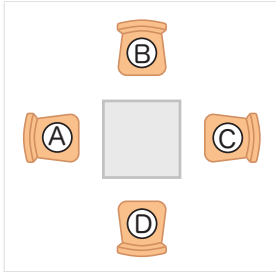
Answer

4

10

Explanation Out to Lunch

First, let's make Dylan take a seat.



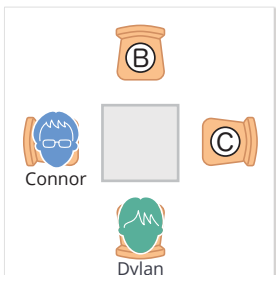
For example, assume Connor sits at (A).



Dylan sits on my right side.

→ Dylan sits at (D).

Next, let's see what Bridgit says.

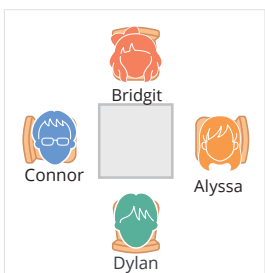


Connor does not sit in front of me.

→ Bridgit does not sit at (C).

This means that Bridgit sits at (C), while Alyssa sits at (B).

Let's check if it goes along with what Alyssa says.



Bridgit and I always sit next to each other.

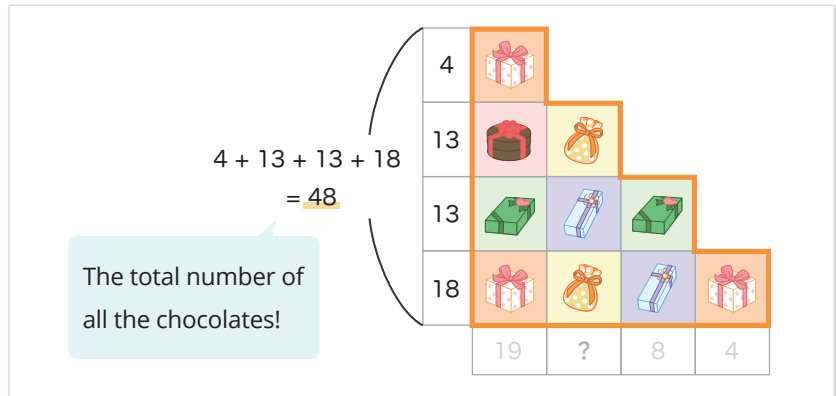
Just like she says, Alyssa and Bridgit sit next to each other.

As you can see, Connor sits on the right side of Bridgit.

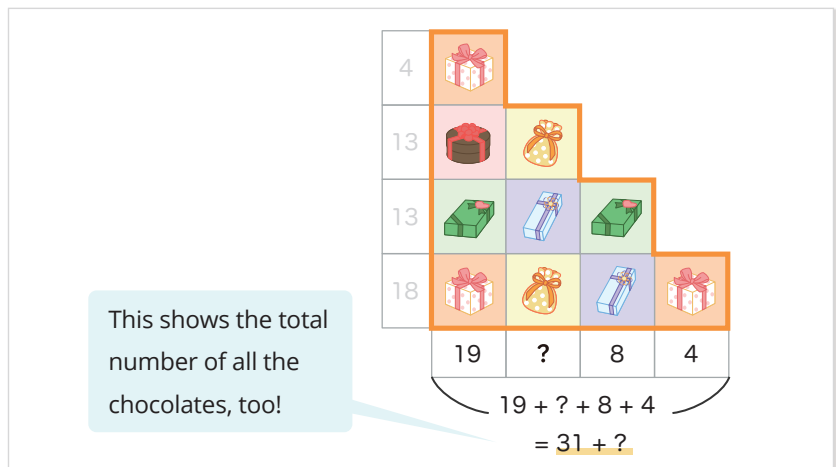
Answer

Connor

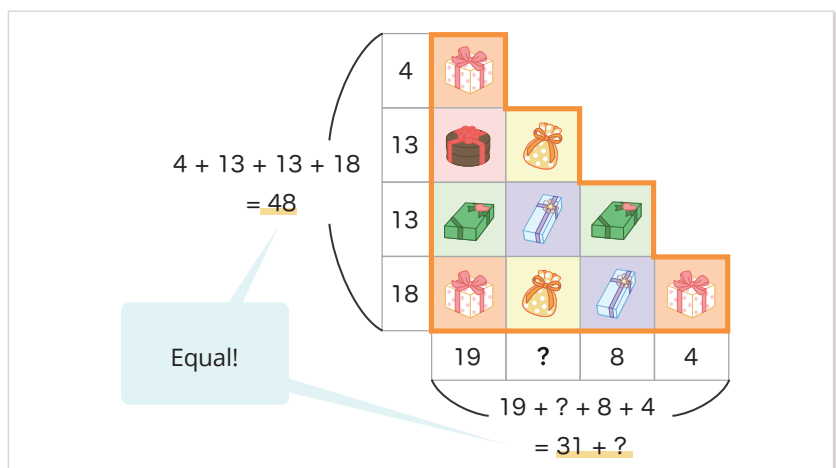
What do you get by adding all the numbers on the left?



What do you get by adding all the numbers at the bottom?



Shows the total number of all the chocolates.



Now let's find '?'.

$$4 + 13 + 13 + 18 = 19 + ? + 8 + 4$$

$$48 = 31 + ?$$

$$? = 17$$

As you can see, '?' is 17.

Answer

17

12

Explanation A Tricolor Puzzle

Let's paint the tiles one by one.

Since Ⓑ cannot be blue, let's try with yellow first.

Ⓒ must be pink.

Ⓓ must be yellow.

▼ If you paint the rest of the tiles...

It also works if you paint Ⓑ with pink.

Ⓓ is blue

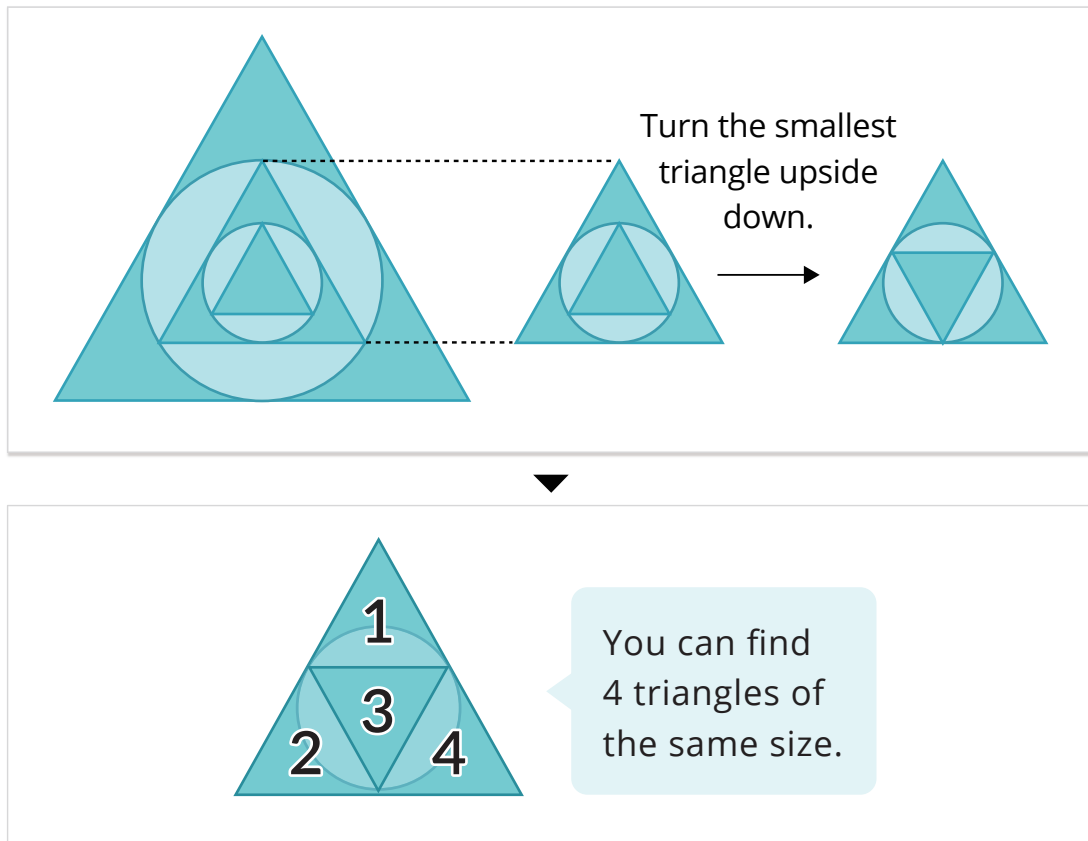
Answer

Blue

13

Explanation Circles and Triangles

Let's compare the smallest triangle with the middle sized triangle.



As you can see, the middle sized triangle is 4 times larger than the smallest triangle.
 The same can be said of the biggest triangle and the middle sized triangle
 - the biggest triangle is 4 times larger than the middle sized triangle!

Therefore the biggest triangle is $4 \times 4 = 16$ times larger than the smallest triangle.

Answer

 16倍
ばい

What are the conditions for A and B?

Let's put
A to the ones' place,
B to the tens' place.

×	8	1	2	
		B	A	
			 $812 \times A = \underline{4}$ digits
			 $812 \times B = \underline{3}$ digits
			 The answer is 4 digits.

$812 \times A = 4$ digit number. What kind of number fits to **A** ?

When the multiplier is greater than 1, **A** is always a 4 digit number. That means, **A** cannot be decided at this moment.

	8	1	2	×	A	=				
×	1			=	8	1	2			
×	2			=	1	6	2	4		
×	3			=	2	4	3	6		
	⋮				⋮					
×	9			=	7	3	0	8		

4 digit numbers

$812 \times B = 3$ digit number. Find out **B**.

	8	1	2	×	B	=	?	?	?	?
×	1			=	8	1	2			
×	2			=	1	6	2	4		
	⋮				⋮					

it becomes 3 digits only when B = 1 !

To get the 4 digit answer, what kind of number fits in the pink boxes?

Only 1 can fit in this box to get the 4 digit answer!

	8	1	2	×	1	A	
1						$812 \times A = \underline{4}$ digits
8	1	2				✓ $812 \times B = \underline{3}$ digits
9						The answer is 4 digits.

The boxes on the left column are all filled!

What number fits in **A** when $812 \times A = 1 \square \square \square$

the answer of $812 \times A$ is a 4 digit number that has 1 in its thousands' place.
 Now, let's check what fits

To get 1 □ □ □
 as an answer...
 $A=2$

$$\begin{array}{r}
 812 \times \boxed{A} = 1 \square \square \square \\
 \hline
 \times \boxed{1} = \cancel{812} \\
 \times \boxed{2} = 1624 \\
 \times \boxed{3} = \cancel{2436} \\
 \vdots \\
 \hline
 \end{array}$$

All the boxes are full!

$$\begin{array}{r}
 812 \\
 \times \quad \boxed{1} \boxed{2} \\
 \hline
 1624 \\
 812 \\
 \hline
 9744
 \end{array}$$


Everything fits!

- ✓ $812 \times A = 4$ digits
- ✓ $812 \times B = 3$ digits
- ✓ The answer is a 4 digit number.

The answer is 9744

Answer

9744



Mr. Campbell

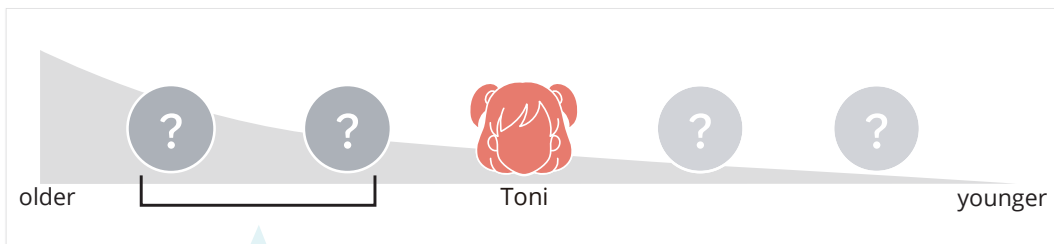
Seymour is older than Miranda. _____ ①


Franny is older than Toni. _____ ②


2 kids between Austin and Miranda. _____ ③

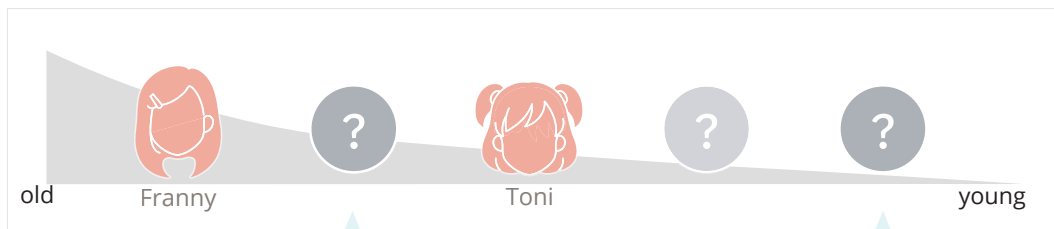
Toni is in the middle. _____ ④

Let's draw a picture from ② and ④.



One of them is  Franny.

< If  Franny is the oldest....>



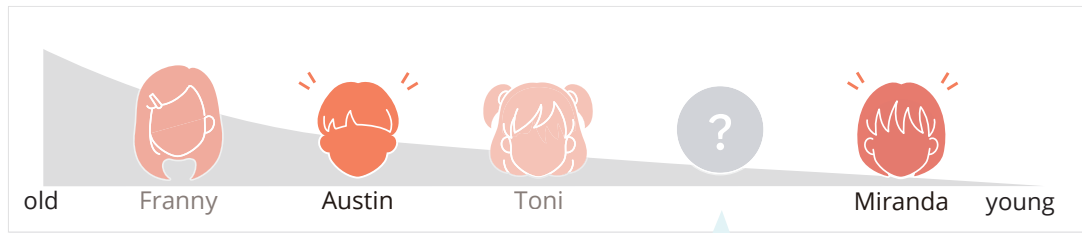
According to ③,


 or 
Miranda or Austin

 or 
Miranda or Austin

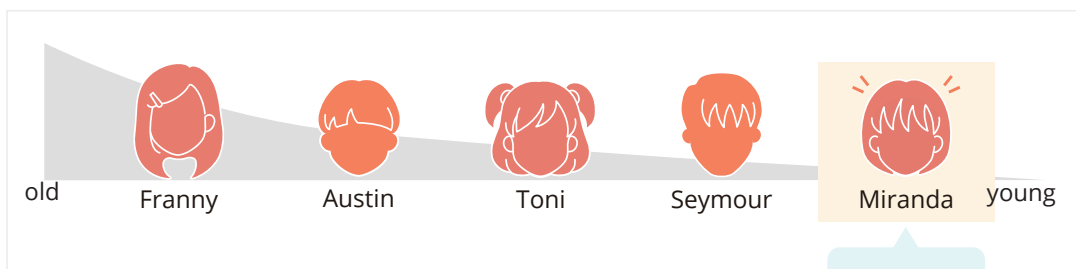
Next Page

From ①, now you see that where  Miranda and  Austin are.



 Seymour comes here.

As you can see, the 5 children of the Campbells are born in the order below:



The answer is Miranda.

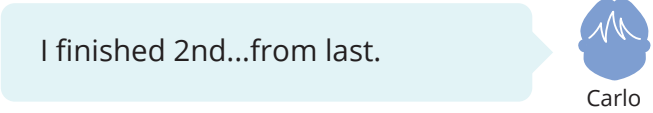
Answer

Miranda

16

Explanation On the Beach

First of all, Carlo is obviously lying.

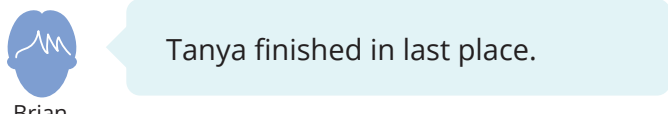


I finished 2nd...from last.

Carlo

The two fastest answered honestly. So they can't say that they finished in 3rd place!

This means that Carlo finished in 4th place.



Tanya finished in last place.

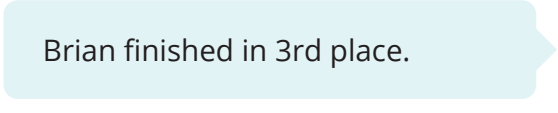
Brian

Remember the two slowest are lying....

According to Brian, Tanya finished in 4th place.

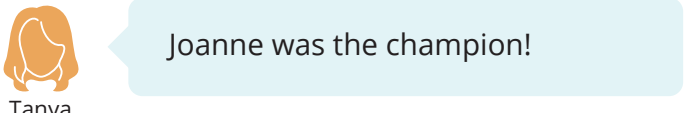
However, we already know that Carlo finished in 4th place.

This means that Brian is also lying. So Brian must have finished in 3rd place.



Brian finished in 3rd place.

Joanne



Joanne was the champion!

Tanya

As Carlo and Brian are lying, Joanne and Tanya are telling the truth.

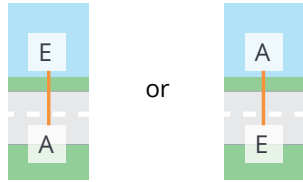
This means that Tanya finished in 2nd place.

Answer

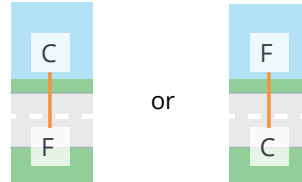
2nd place

Explanation The A.B.C. Neighbors

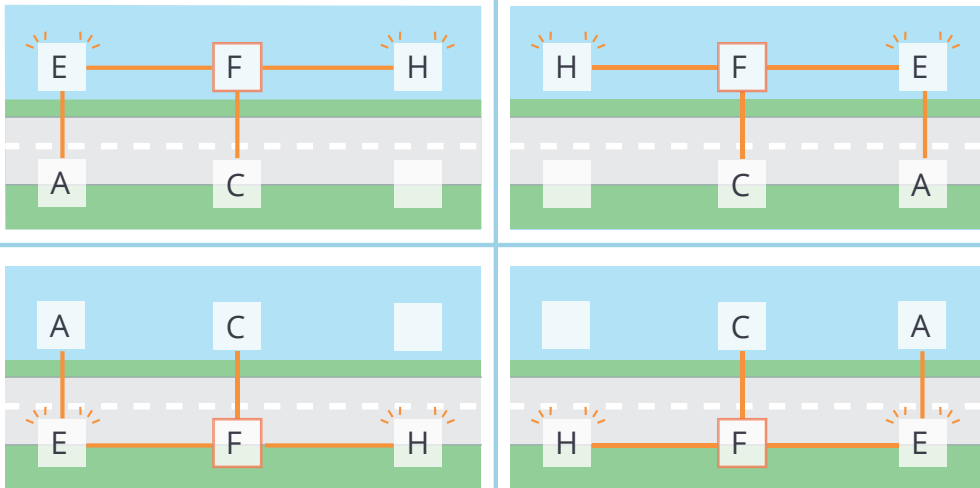
"Hint 1 : E lives right across the street from A". What does this look like?



"Hint 2 : C lives right across the street from F". What does this look like?

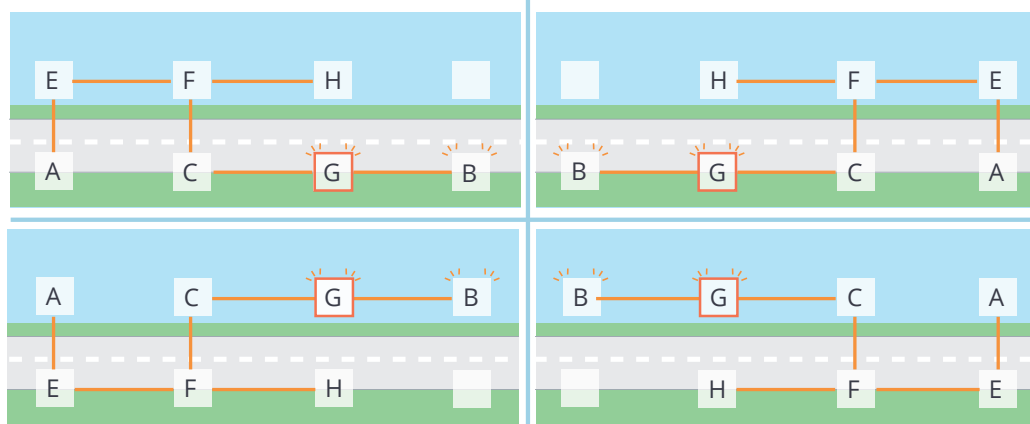


Mix the image you got from Hints 1 and 2, then add this: "Hint 3: F lives in between E and H".



There are four possibilities.

Now add in this: "Hint 4: G lives in between C and B".



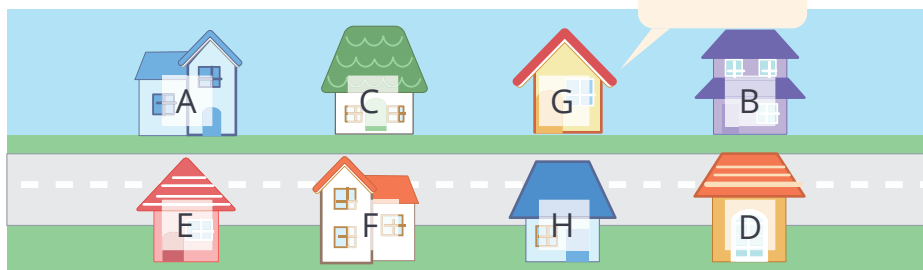
From the four possibilities, which one fits "Hint 5: D lives in House VIII" ?



<table border="1"> <tr><td>E</td><td>F</td><td>H</td><td></td></tr> <tr><td>A</td><td>C</td><td>G</td><td>✗</td></tr> </table>	E	F	H		A	C	G	✗	<table border="1"> <tr><td></td><td>H</td><td>F</td><td>E</td></tr> <tr><td>B</td><td>G</td><td>C</td><td>✗</td></tr> </table>		H	F	E	B	G	C	✗
E	F	H															
A	C	G	✗														
	H	F	E														
B	G	C	✗														
<table border="1"> <tr><td>A</td><td>C</td><td>G</td><td>B</td></tr> <tr><td>E</td><td>F</td><td>H</td><td>D</td></tr> </table>	A	C	G	B	E	F	H	D	<table border="1"> <tr><td>B</td><td>G</td><td>C</td><td>A</td></tr> <tr><td></td><td>H</td><td>F</td><td>✗ E</td></tr> </table>	B	G	C	A		H	F	✗ E
A	C	G	B														
E	F	H	D														
B	G	C	A														
	H	F	✗ E														

Only this one fits!

Now you can see where every family lives.



G lives in House III.

Answer

G

18 Explanation Tennis Tournament

In a tournament, only the winner goes to the next match. The loser cannot play again. This means that the number of matches is same as the number of losers.

At the end of the tournament, we have only one winner. All the other players have lost a match. The number of losers is: $100-1=99$

This means that there are 99 matches in the tournament.

Answer

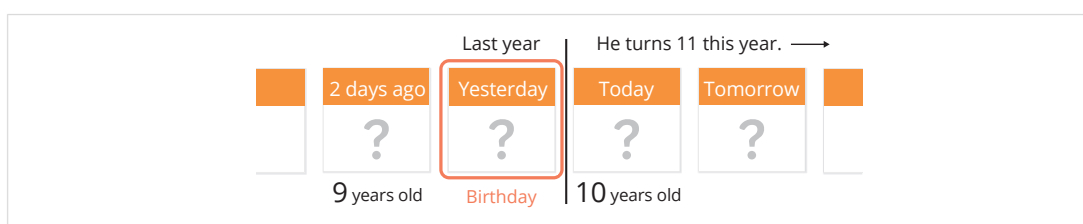
99 matches

19 Explanation What's the Date Today?

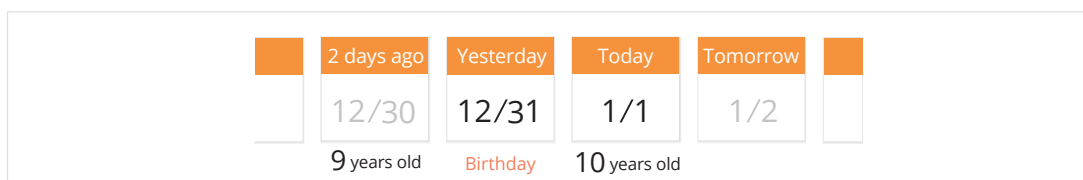
Pete is 10 years old. Two days ago, he was 9 years old. This means that his birthday is either today or yesterday.



He is turning 11 this year. This means that he has not yet celebrated his birthday this year. Now we understand that it was his birthday yesterday!



Therefore,



his birthday was December 31st, and it is January 1st today. Happy New Year!

Answer

January 1st

To start, let's think about it like this: 'What if there are ★★ fibber(s)?'

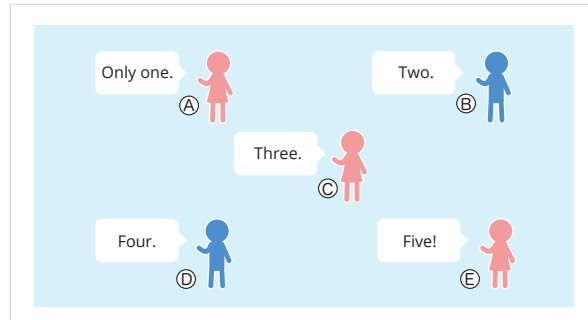
Those who are telling the truth must give the same number.

Now let's check what everyone says.

Nobody gives the same number.



This means that either 0 or 1 of them is telling the truth.



What if none (0) of them are telling the truth?

That means all 5 of them are fibbing.

What if 1 of them is telling the truth?

That means 4 of the 5 people are fibbing.

As you can see, 1 of them is telling the truth - so 4 of them are fibbers!

Answer



4 of them



What does it mean that you were better than somebody in five out of six events?



It means that you did not come in last place in more than one event.



Since there were 6 events and 6 kids, each person came in last in one event each.



Now, let's rephrase what they say in the question.



 was better than  in all six events except for the one he came in last.


 was better than  in all six events except for the one he came in last.

 was better than  in all six events except for the one he came in last.







 was better than  in all six events except for the one he came in last.

 was better than  in all six events except for the one he came in last.

 was better than  in all six events except for the one he came in last.







When  came in last, where were the other people?







I was better than Simon. I was better than Tobias. I was better than Nana. I was better than Hadia. I was better than Ricki. I came in last.







 →  →  →  →  → 







1st **2nd** **3rd** **4th** **5th** **6th**







Likewise, you can see the rankings in the other 5 events, too.

 →  →  →  →  → 

 →  →  →  →  → 

 →  →  →  →  → 

 →  →  →  →  → 

 →  →  →  →  → 

When Nana is in 3rd place, who is in 1st place?



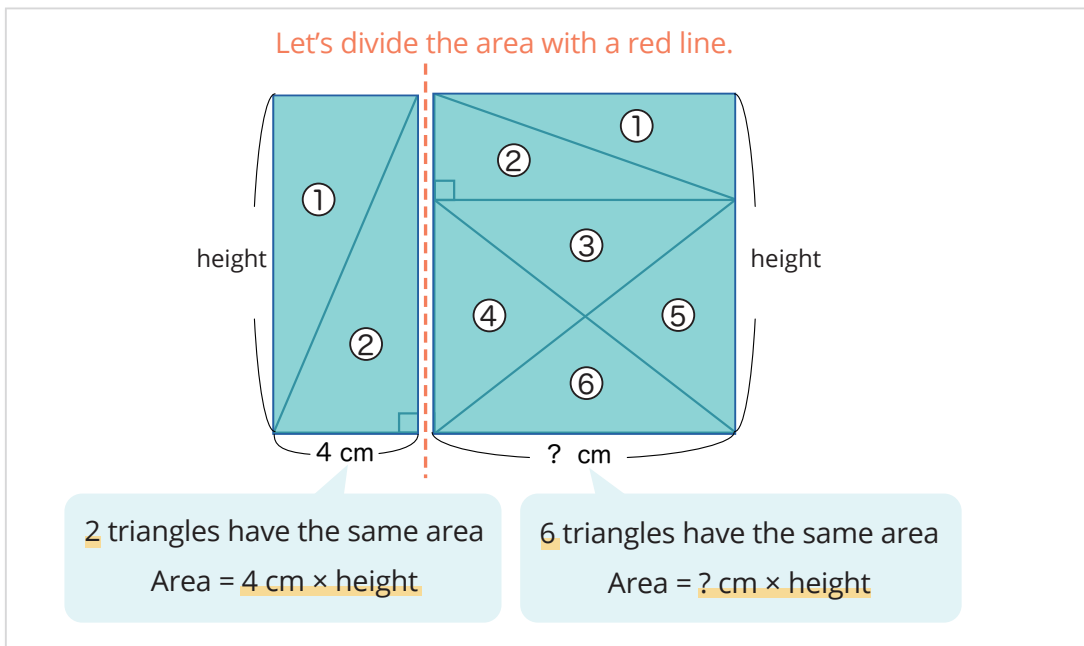
The answer is Simon.

Answer

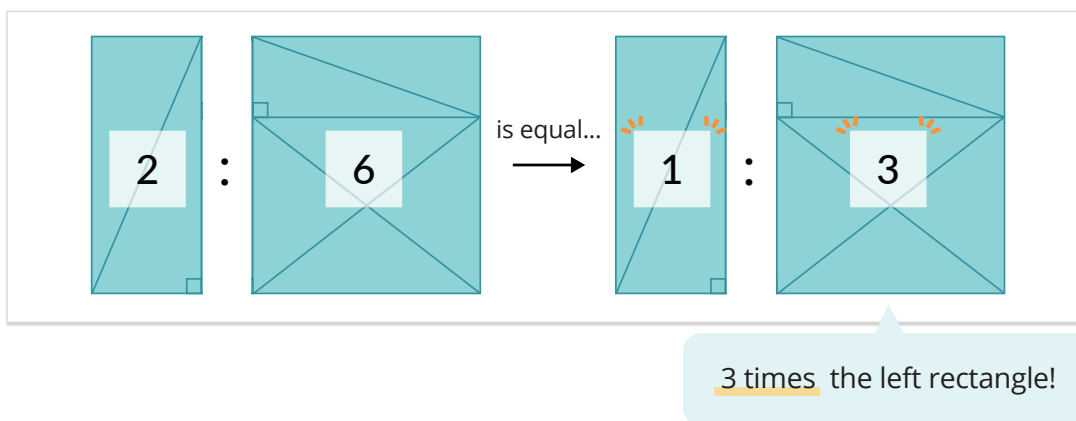
Simon

22

Explanation Clover Patch

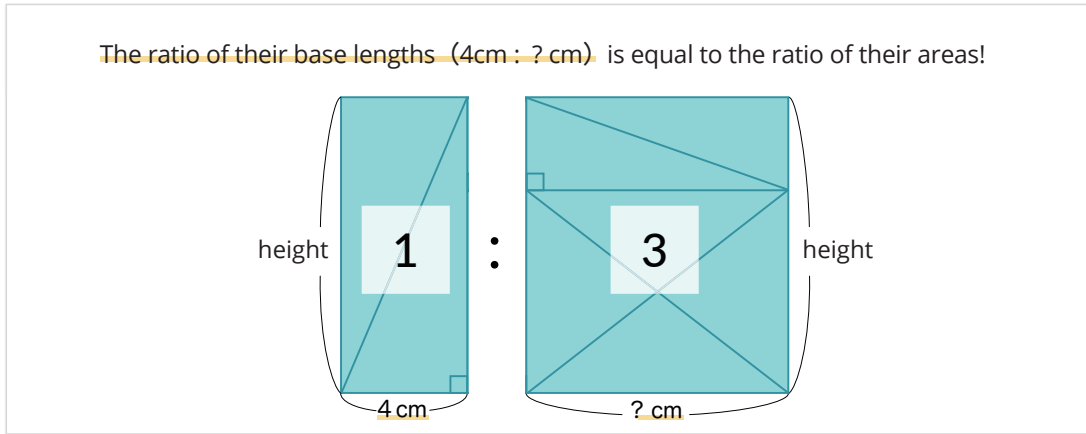


Let's count the number of triangles,
and express the area of these two rectangles in ratio form.



Next Page

Both rectangles have the same height.



The right rectangle has 3 times the area of the left rectangle.

So, the base length of the right rectangle (? cm) is 3 times longer than the base length of the left rectangle (4 cm).

Therefore the length of “?” is $4\text{cm} \times 3 = 12\text{ cm}$!

Answer

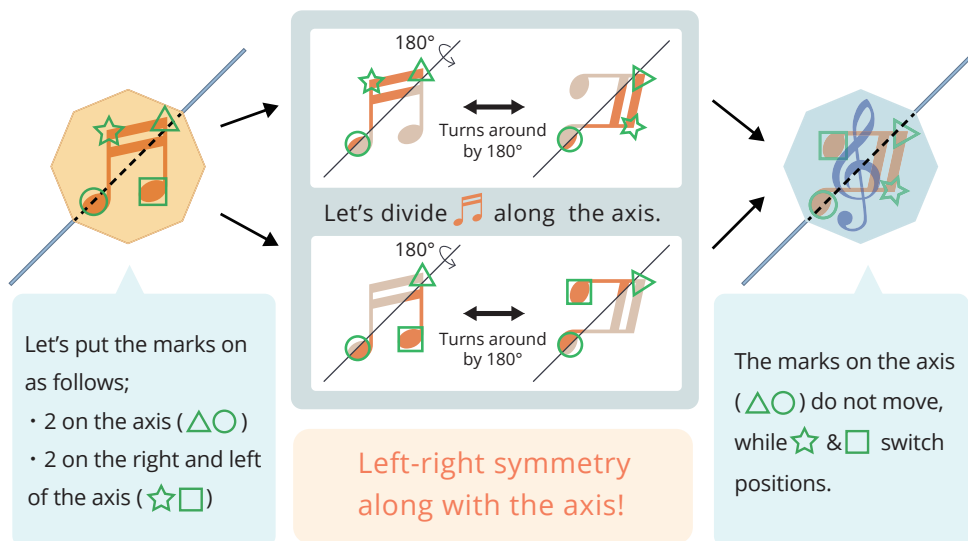
12 cm

23

Explanation Rotating Card in the Wind

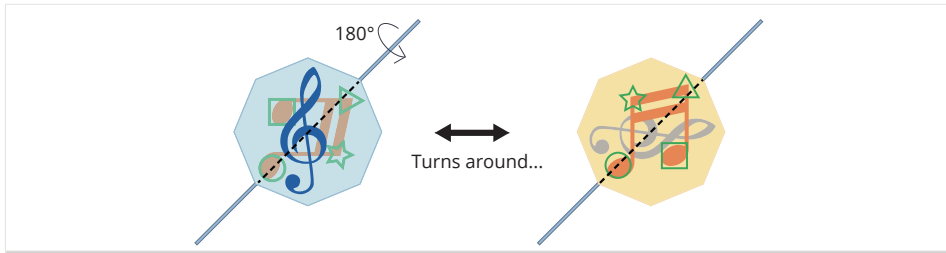
If the panel is transparent, how does 🎵 look behind 🎵 ?


Put four types of marks on 🎵 and rotate the panel by 180°.

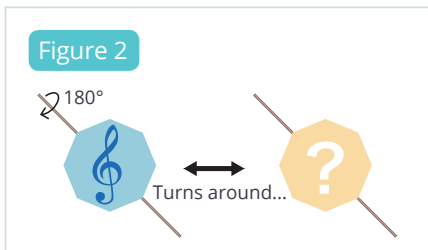


Next Page

Now you can see what the back looks like.



Put four marks on , and see how it looks after it rotates by 180°.

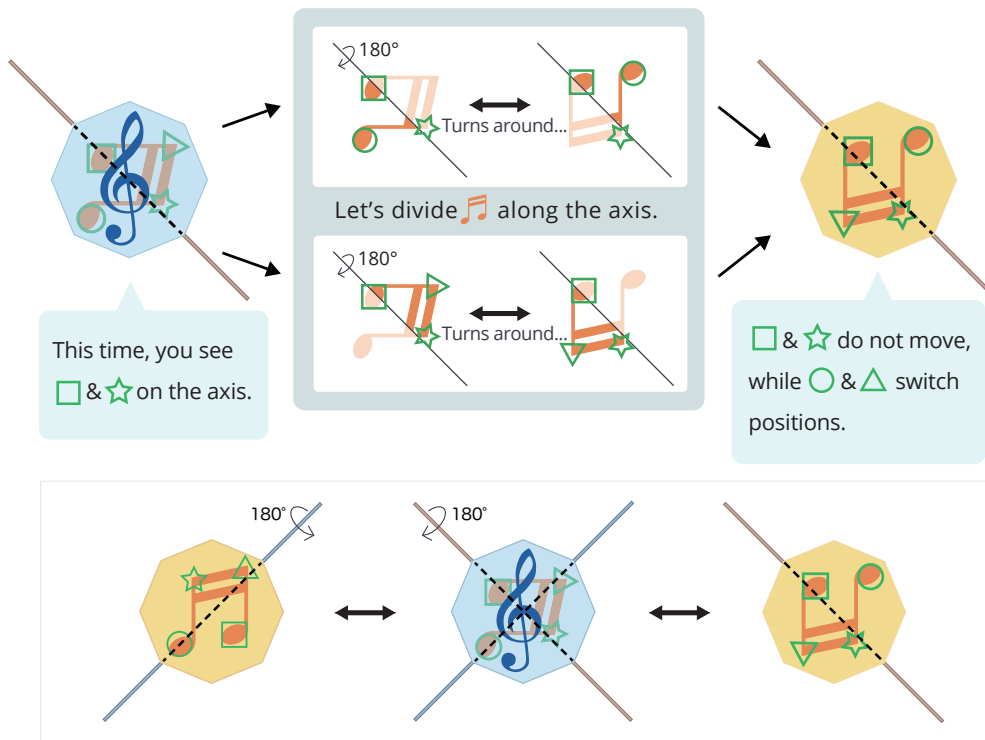


Check if the mark is "on the axis" or "on the right/left side of the axis".

When you rotate the panel by 180° around the axis,

- the marks on the axis do not move.
- the marks on the left/right side of the axis switch positions.

Let's check if this happens this time, too.



The answer is B.

Answer

B

Let's make a table with the statements made by the four.

	 Ian	 Fiona	 Nicholas	 Ysabel	 Gareth	 Megan
Student 1	✓	✓			✓	
Student 2	✓		✓	✓		
Student 3		✓		✓		✓
Student 4	✓		✓		✓	

Tick ✓ the box if he/she might have been late.

→ These two statements are contradictory.




= One of them must be lying.






Students 1 and 2 both must be lying.

Remember that 3 of them are lying.




< Statement by Student 1 >

"  or  or  came late. "




If this is a lie, then

"  ,  and  were not late. "

< Statement by Student 2 >

"  or  or  came late. "

↓ If this is a lie, then

"  ,  and  were not late. "

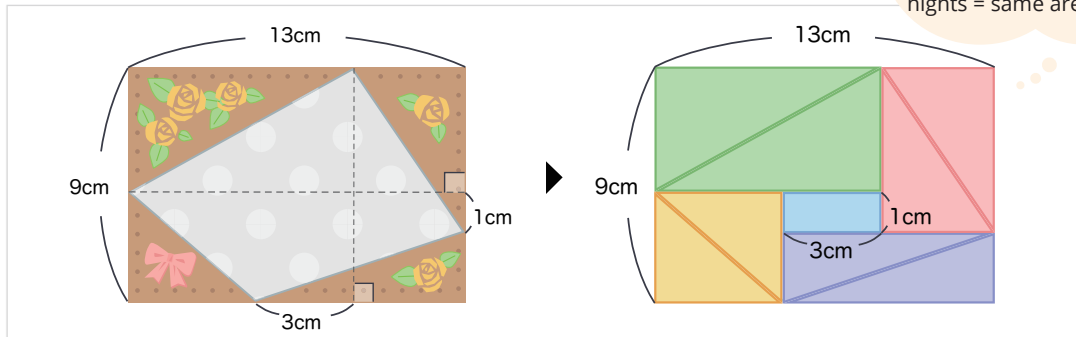
Therefore, it was Megan who came late to the class.


Answer

Megan

25 Explanation In The Frame

Let's divide the photo frame into 9 parts.



The area of the photo that can be seen  is

$$\left(\begin{array}{c} \text{Green Triangle} \\ \text{Yellow Triangle} \\ \text{Blue Rectangle} \\ \text{Purple Triangle} \\ \text{Red Triangle} \end{array} + \text{Blue Rectangle} \right) \div 2$$

$$= \frac{(9 \times 13 + 1 \times 3)}{2}$$

$$= \underline{60\text{cm}^2}$$

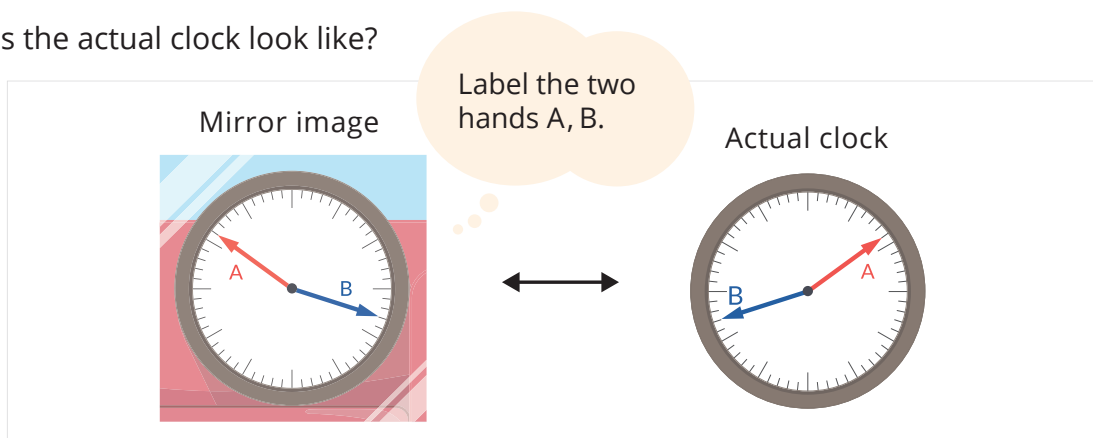
In this way you will get the area for the frame.

Answer

60cm²

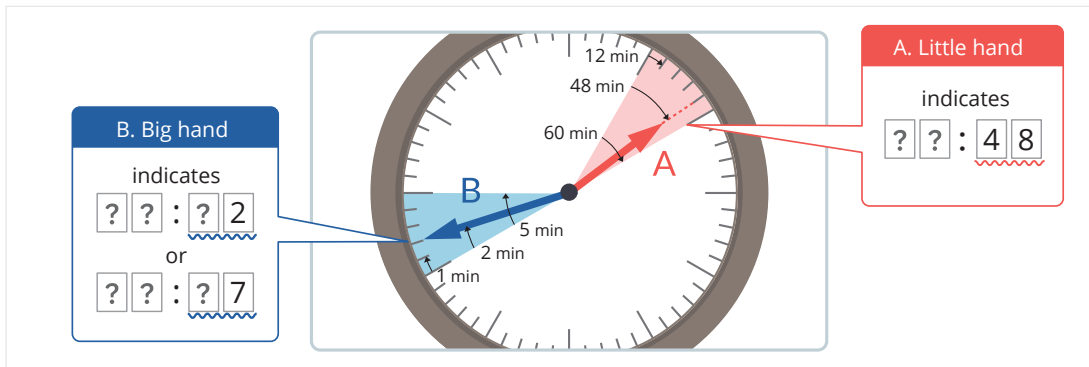
26 Explanation Clock in a Mirror

What does the actual clock look like?



Next Page

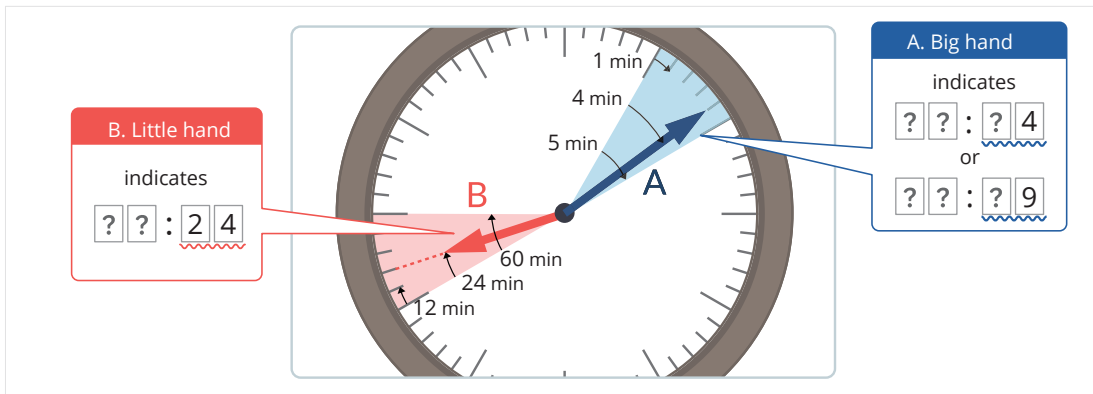
What if A is the little hand and B is the big hand?



A and B cannot indicate the same time - they do not match.

→ A is NOT the little hand.

What if A is the big and and B is the little hand?



Now, place the clock in the right position and fill out the clock face accordingly.

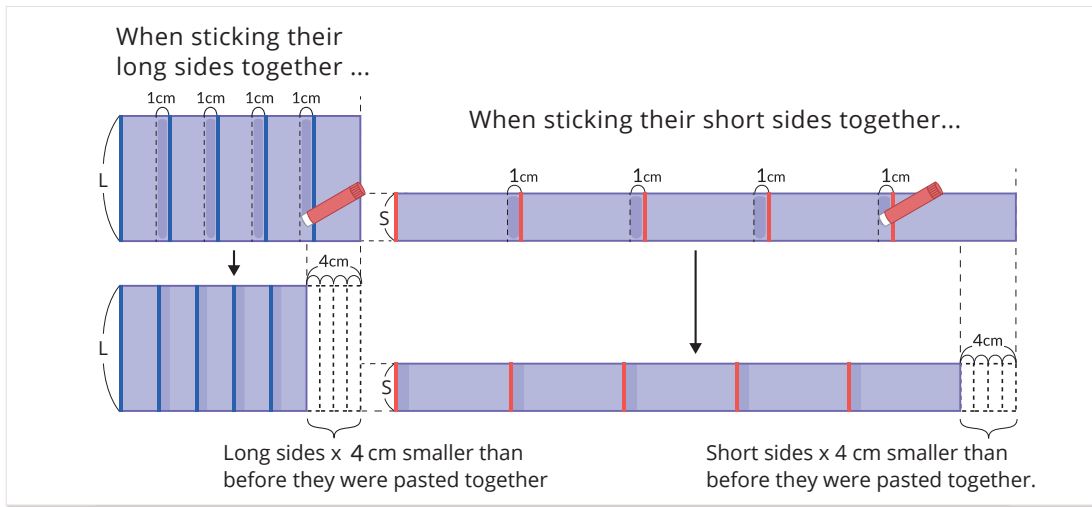


The clock shows 11:24 !

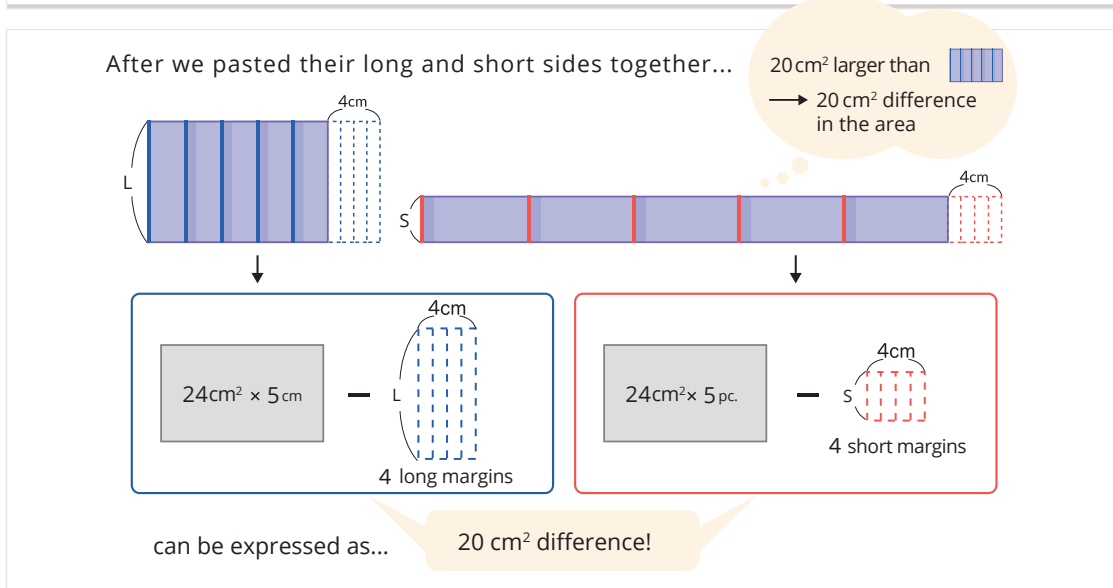
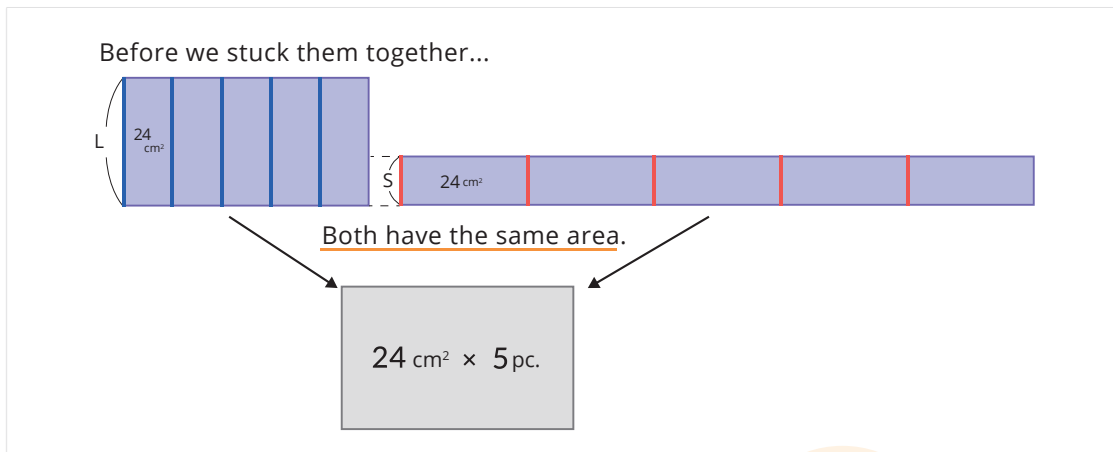
Answer

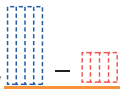

11:24

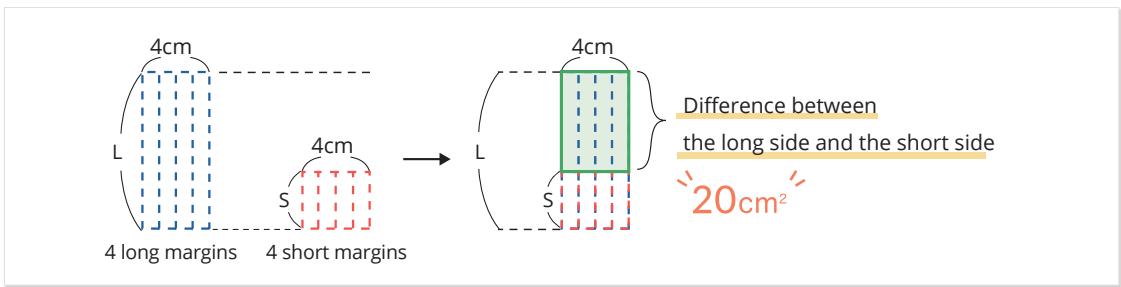
Compare the area before and after they were stuck together.



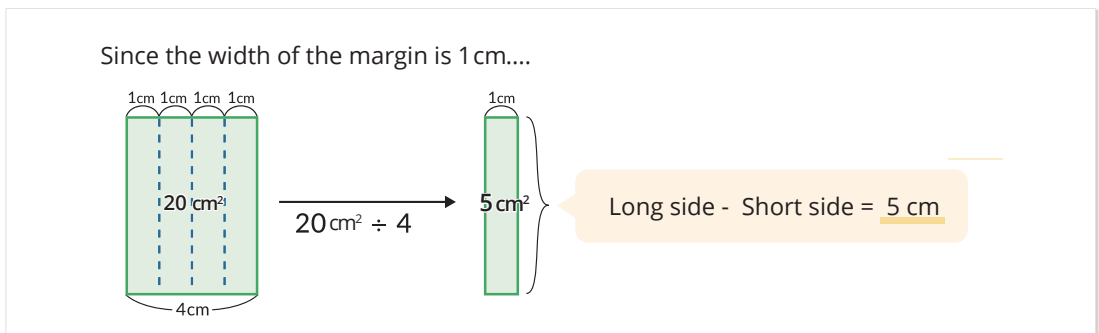
Compare the area of the margins made in the long sides and short sides.



That means,  -  = 20 cm² !



Find the difference between the length of the long side and the short side.



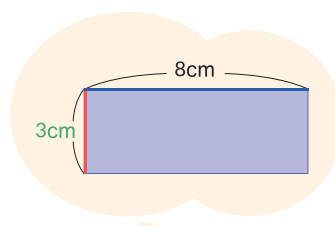
Find a rectangle that can fulfill the two conditions given in III and IV.

⟨Condition 1⟩ Has an area of 24 cm²
 ⟨Condition 2⟩ Long side - Short side = 5 cm

List the sizes of the the rectangles that fulfill ⟨Condition 1⟩ .
 Then, find the one that also fulfills ⟨Condition 2⟩ .

⟨Condition 1⟩ Has an area of 24 cm²

<u>Long side</u>	<u>Short side</u>
• 24cm	× 1cm
• 12cm	× 2cm
• <u>8cm</u>	× <u>3cm</u>
• 6cm	× 4cm



Also fits to ⟨Condition 2⟩
 Long side - Short side = 5cm

Therefore, the short side of the rectangle is 3 cm.

Answer

3cm

Look at the last sentence of the question.

How much do you have to spend to get three marbles of the same color?



When will you have collected three marbles of the same color?

For example, let's see when you will have collected three red marbles.

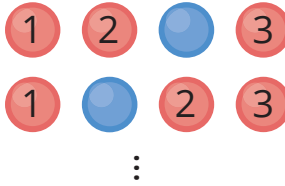
You may have three red marbles after you tried....

3 times.
Need 30¢.



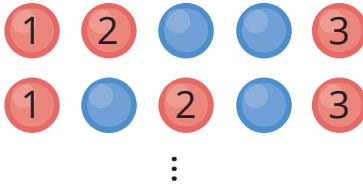
You are not always this lucky - you may get a blue marble.

4 times.
Need 40¢



You cannot be 100% sure - you may get two blue marbles.

5 times.
Need 50¢.



You have collected either 3 red marbles or 3 blue marbles for sure!

e.g.



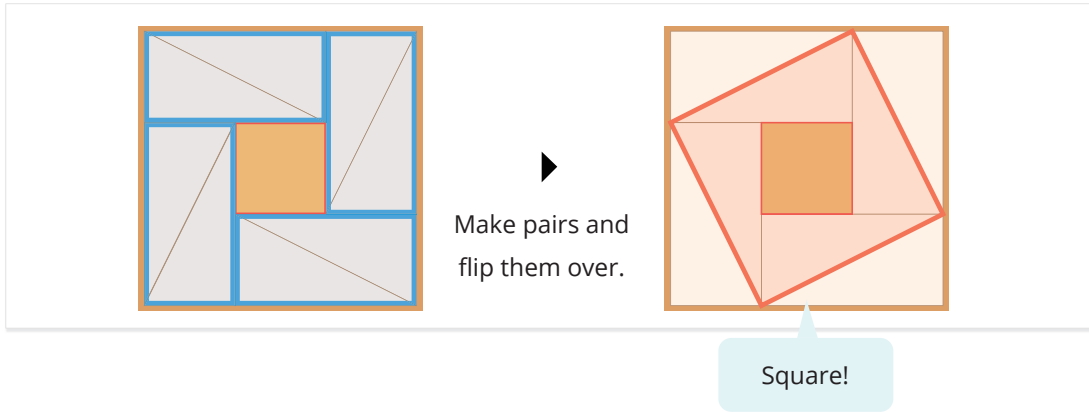
By this time, you have collected 3 marbles of the same color!

As you can see, you need to spend at least 50¢ to get three marbles of the same color.

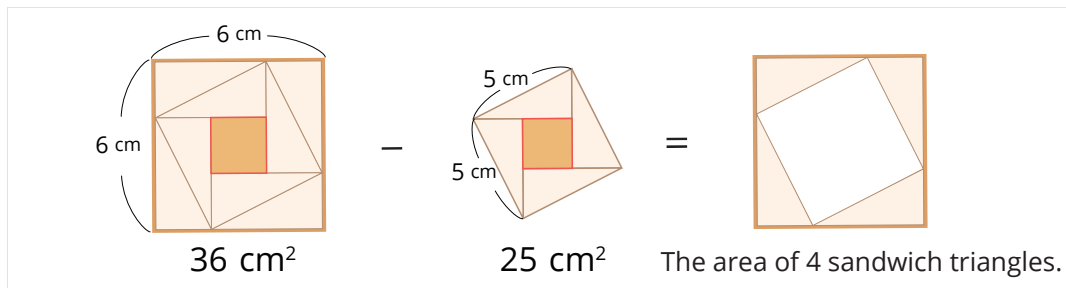
Answer

50¢


Let's rearrange the sandwich triangles.

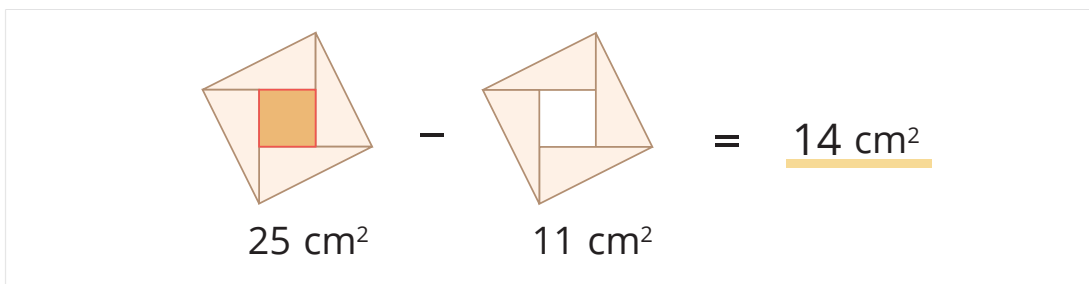


Compare the areas of two squares.



Now you see that the area of 4 sandwich triangles is 11 cm² .

Find the area of the empty square  .



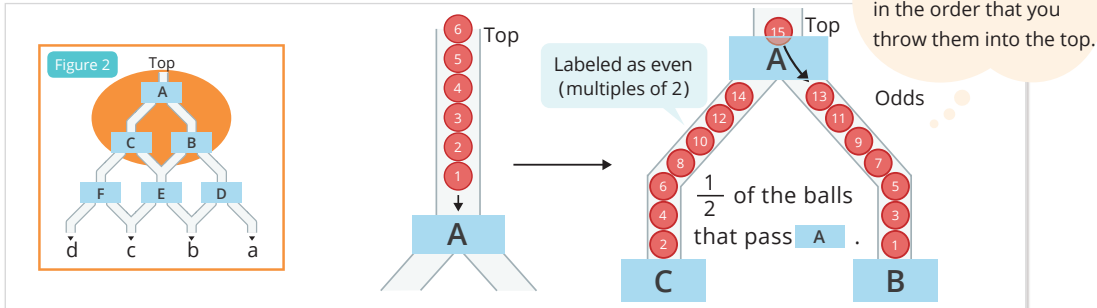
The area of the empty square is 14cm².

Answer

14cm²

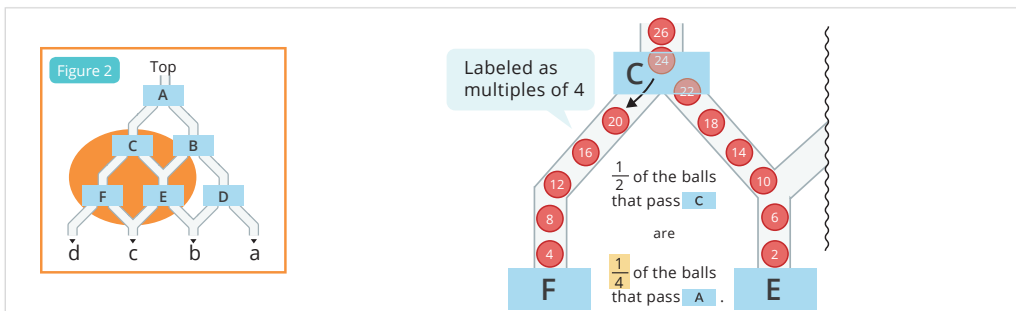
What kind of balls are always sorted to the left?

Firstly, let's check **A**.



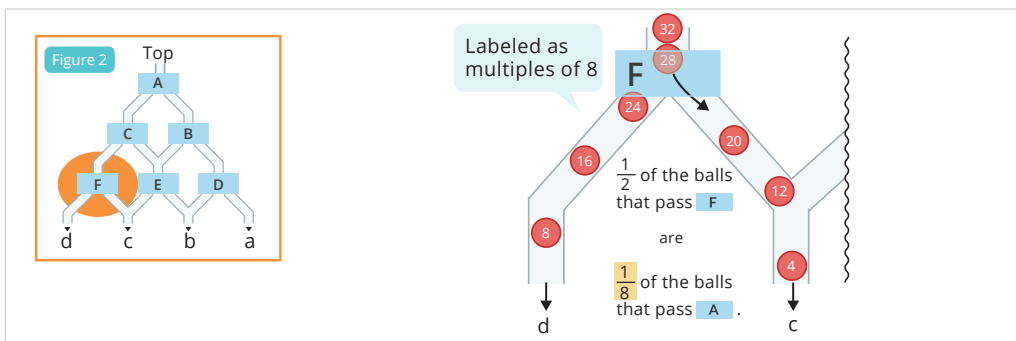
Half of the balls that pass **A** go to **C** and they all have even numbers (multiples of 2).

Next, let's look at **C**.



The half of the balls that pass **C** go to **F**. That means $\frac{1}{4}$ of the balls that pass **A** go to **F** and they are all labeled as multiples of 4.

Next, let's look at **F**.



The half of the balls that pass **F** go to exit 'd', and $\frac{1}{8}$ of the balls that pass **A** go to exit 'd'.

The balls that go to exit 'd' are all labeled as multiples of 8.

Answer

8 balls

5 Types of Thinking Strategies Drill

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