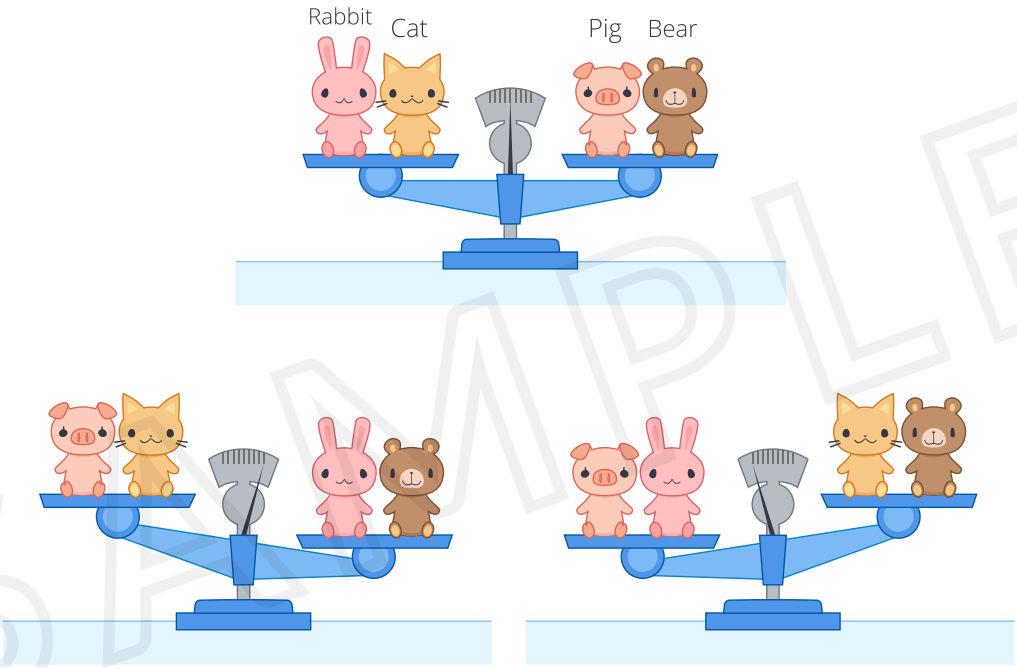
01 Which is the Lightest Animal?

Question

There are four kinds of stuffed animals–a pig, a cat, a rabbit, and a bear.

They are placed on balance scales as shown below.

Which one is the lightest of the four?



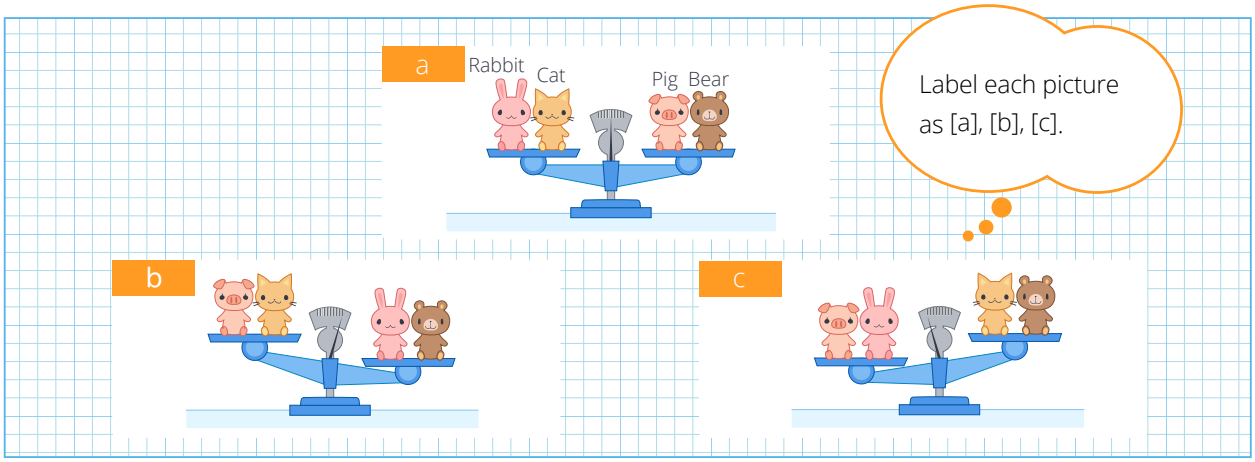
1 Pig 2 Cat 3 Rabbit 4 Bear

Answer

The answer is 2 Cat.

Go to the explanation!

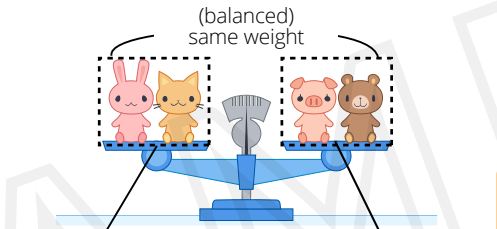
01 Explanation



Point Put animals of the same weight on both sides of the scale.

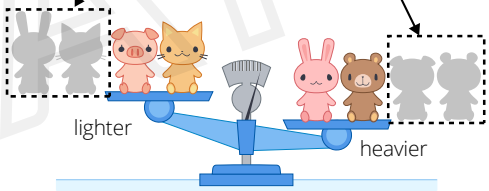
Step ① Compare [a] with [b].

a



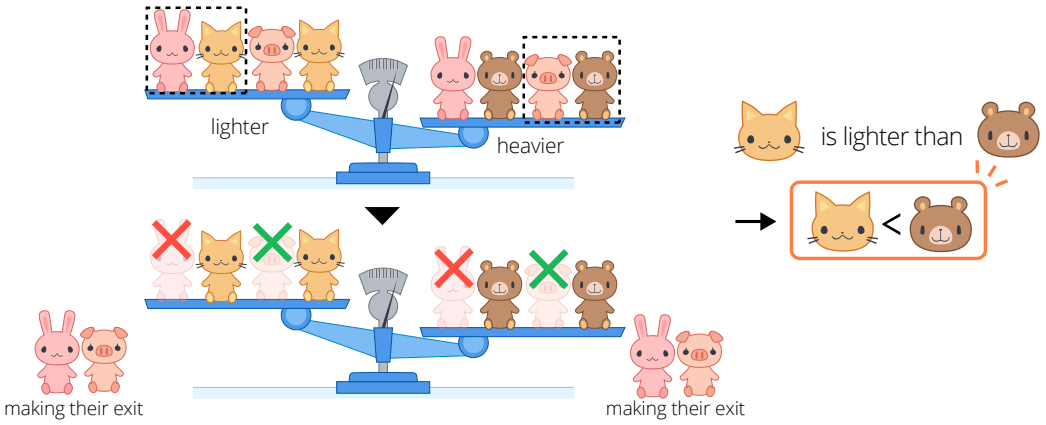
Put them on scale [b].

b



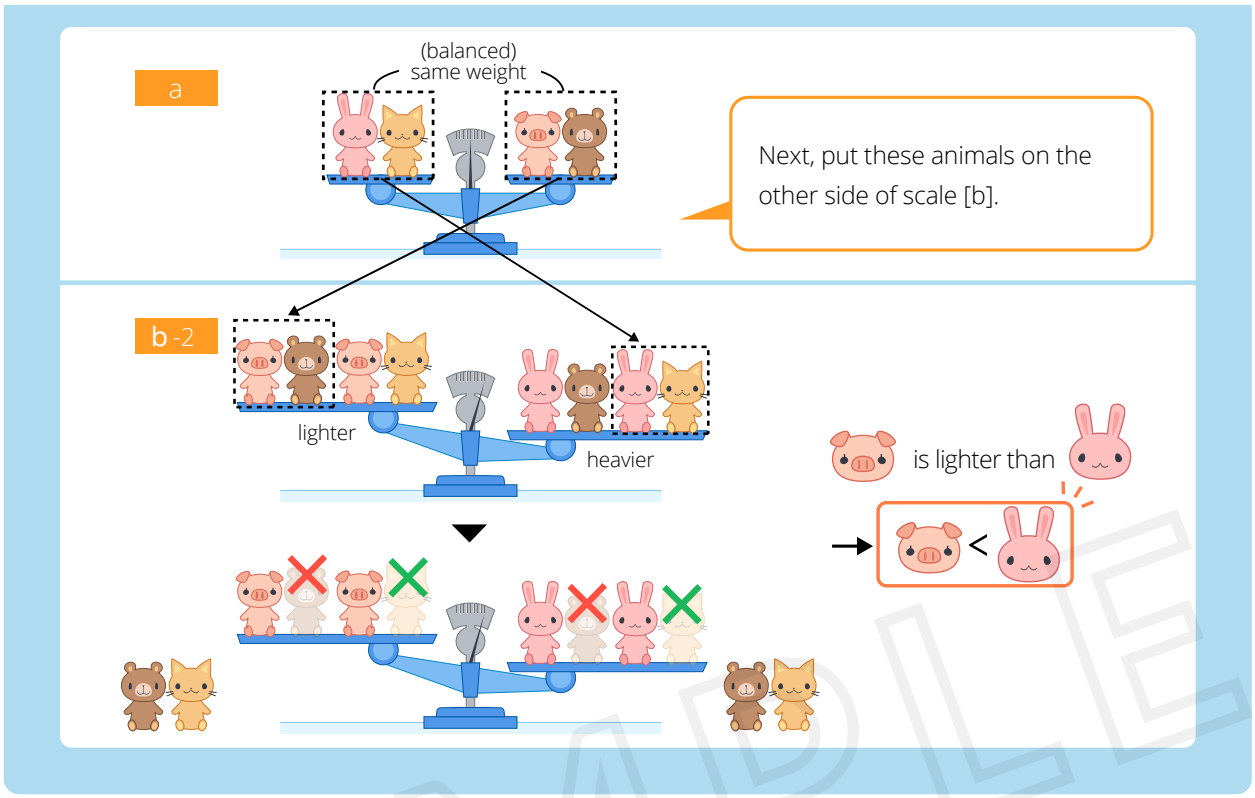
The pointer on the scale does not move, as animals of the same weight were added.

b -1 Remove the animals which are on both sides of the scale.

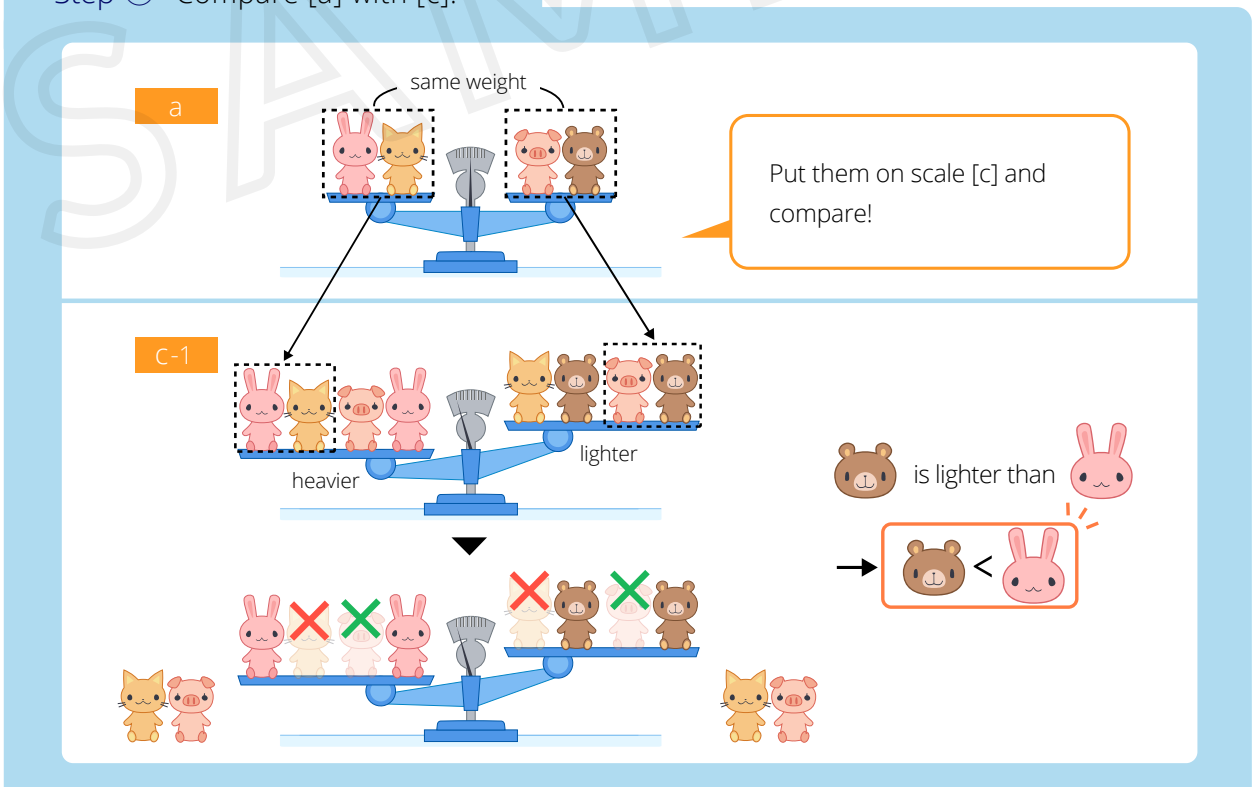


Move on!

01 Explanation

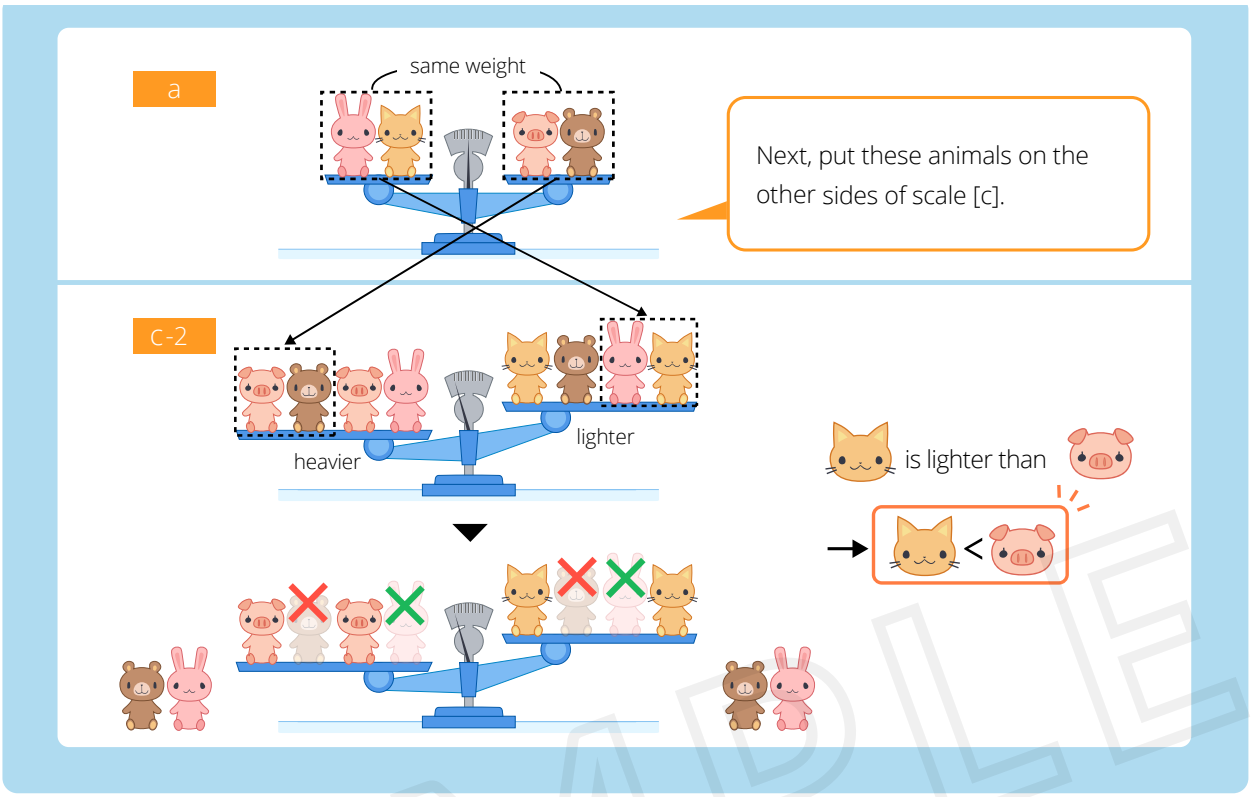


Step ② Compare [a] with [c].



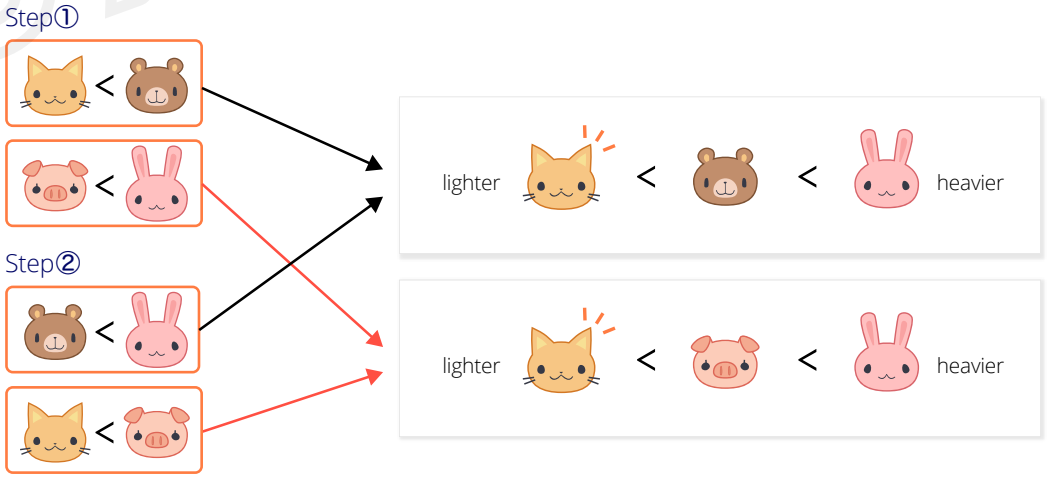
Move on! →

01 Explanation



Result Which is the lightest?

As in steps ① and ②, the relation between the animals in weight is as follows...



Therefore, the answer is: 2 The cat is the lightest.

02 4-Digit Password

Question

Joey had totally forgotten the password for his cell phone.

He tried to remember the number.

After missing out all five tries, he finally nailed it at the sixth shot. He found out that every guess he made included two correct digits, although they were not put in the correct places.

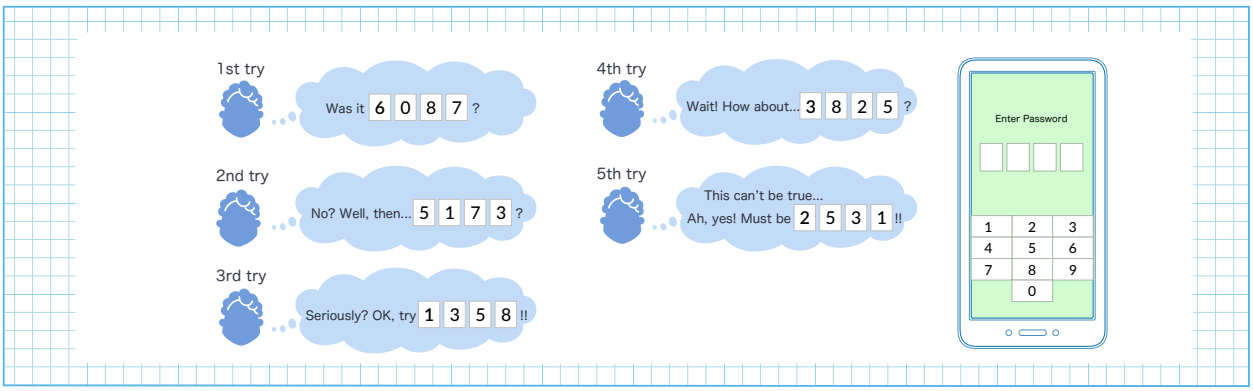
What is the four digit code needed to unlock the phone?

Answer

The answer is 8712.

Go to the explanation!

02 Explanation



Step ① What numbers are **not** used for the password?

Question

After missing out on all five tries, he finally nailed it at the sixth shot. He found out that every guess he made included two correct digits, although they were not put in the correct places.

Read the question carefully and let's put it in a simpler way.

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1
	↓	↓	↓	↓
	?	?	?	?

0	~~0~~	0	0
~~1~~	~~1~~	1	~~1~~
~~2~~	2	~~2~~	2
~~3~~	~~3~~	~~3~~	~~3~~
4	4	4	4
~~5~~	~~5~~	~~5~~	~~5~~
~~6~~	6	6	6
7	7	~~7~~	~~7~~
8	~~8~~	~~8~~	~~8~~
9	9	9	9

Point

All the numbers Joey used were put in the wrong places - so we can't use numbers in their original position.

Not used in any place!

Move on! →

02 Explanation

Step ② What numbers **are** used for the password?

According to Step ①, let's exclude 3 & 5. They aren't used at all.

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1

Since "every guess he made included two correct digits",

Point

1, 2, 7, 8 are definitely in!

Step ③ Arrange the four digits to discover the password.

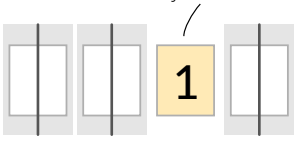
Now it's time to decide the order of 1, 2, 7, 8.

Remember that each digit cannot be put in the place that Joey originally tried.
Let's look at each digit one by one.

I. Where does 1 go?

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1

→

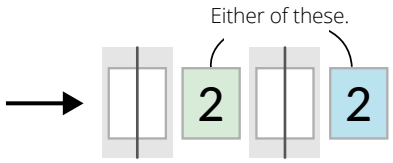


Move on! →

02 Explanation

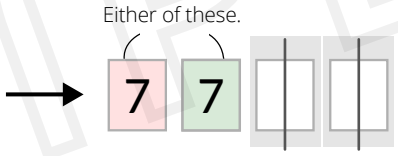
II. Where does 2 go?

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1



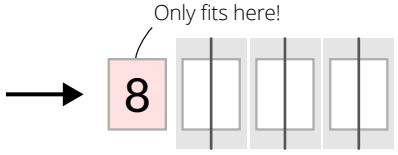
III. Where does 7 go?

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1



IV. Where does 8 go?

Joey's 1st try	6	0	8	7
2nd try	5	1	7	3
3rd try	1	3	5	8
4th try	3	8	2	5
5th try	2	5	3	1



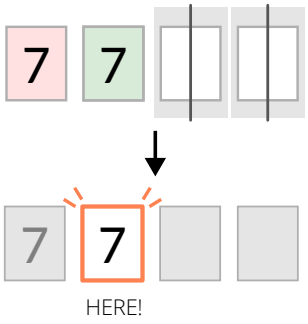
Move on!

02 Explanation

Now, you can work out the position for 7.

Fixed digits

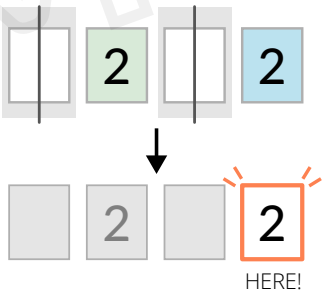
Which place is for 7?



Finally, you can work out the position for 2!

Fixed digits

Where does 2 go?



Result

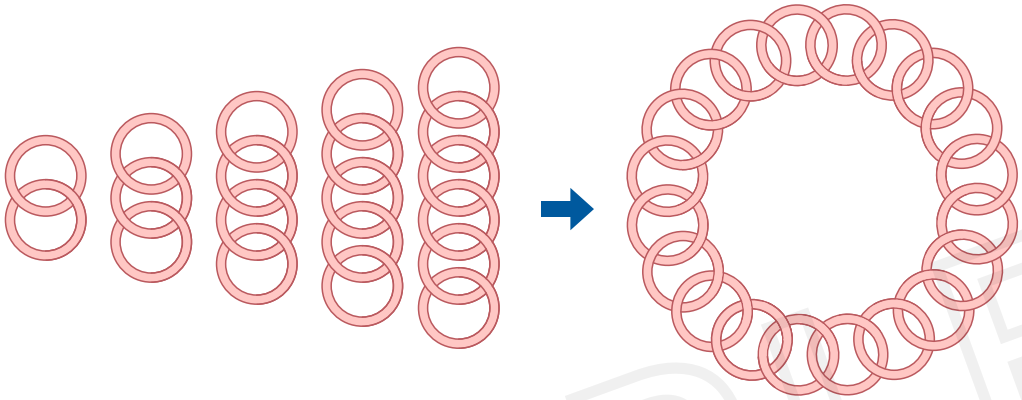
According to Steps ①, ② & ③,

the four digit password is 8 7 1 2.

03 Five Sets of Rings

Question

We assemble five sets of jump rings into a linked circle as shown below.



The rules to assemble rings are as follows:

It costs $1 to cut open a ring.

It costs $2 to weld a ring closed.

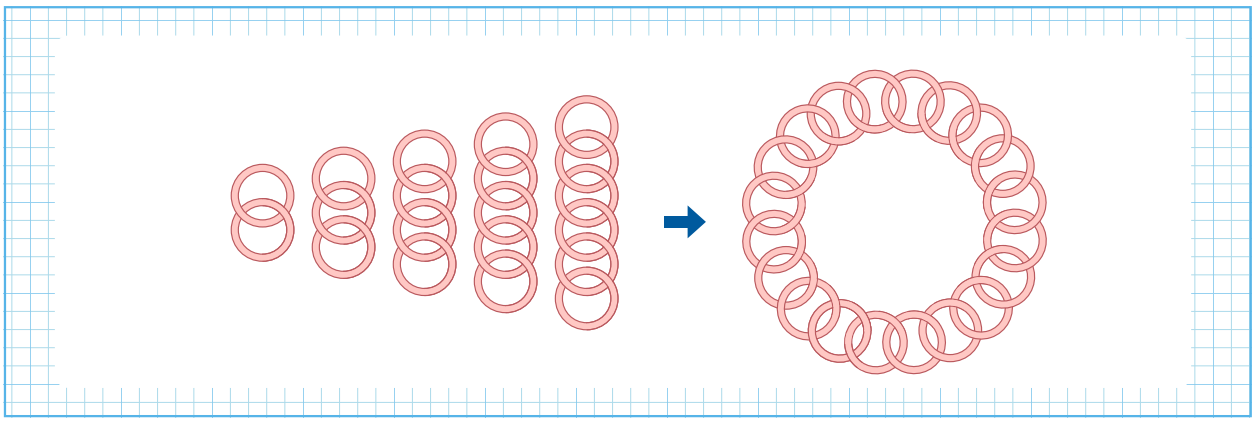
What is the lowest fee to make it?

Answer

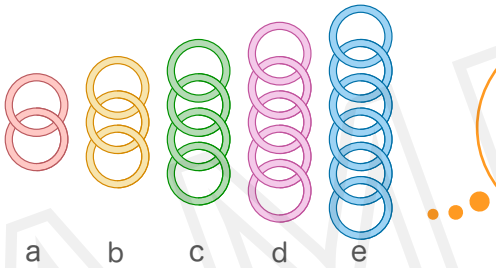
The answer is $12.

Go to the explanation!

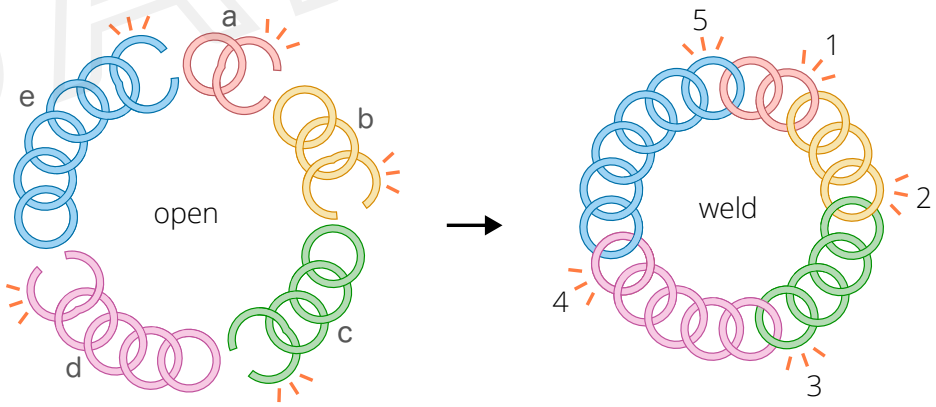
03 Explanation



Step① Cut open one ring from each set and join it to the next set!



Let's give them 5 different colors!
It looks much clearer.



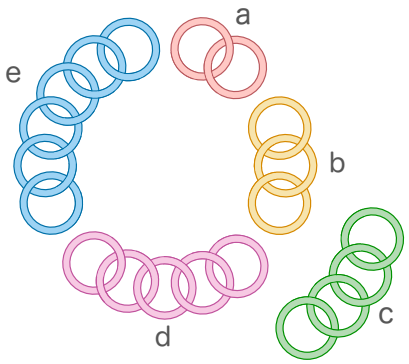
Since it costs $1 to cut open  and $2 to weld  a ring...

A pair of one "open" & one "weld" costs $3. **$3 × 5 pairs = $15**

Move on! →

03 Explanation

Step ② Can we make fewer than five pairs?



Point

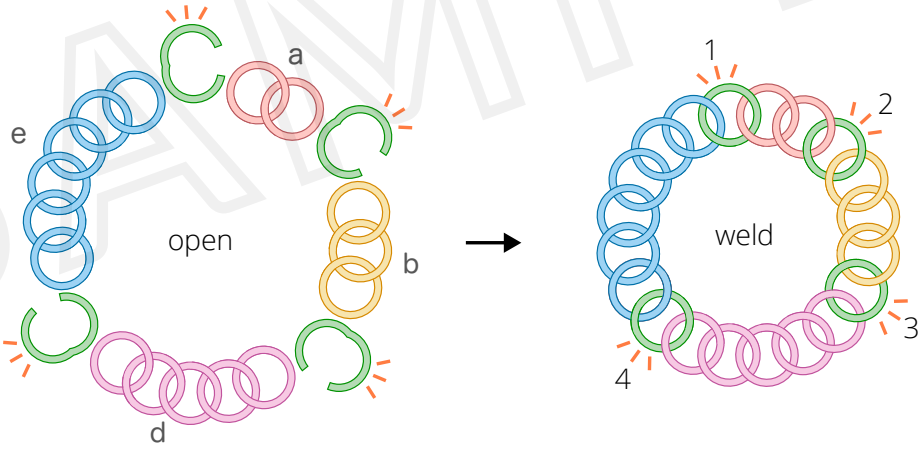
What if there were fewer joints?

⬇

Reduce the number of joint rings!

Choose "Ring Set [c] and cut all the rings open!" ccccc

Then use those rings as joints between the rest of ring sets [a, b, d & e].



Now, we only need 4 pairs of "open" & "weld"!

meaning...the lowest cost possible is **$3×4 pairs = $12**

Therefore, the answer is "**12**".

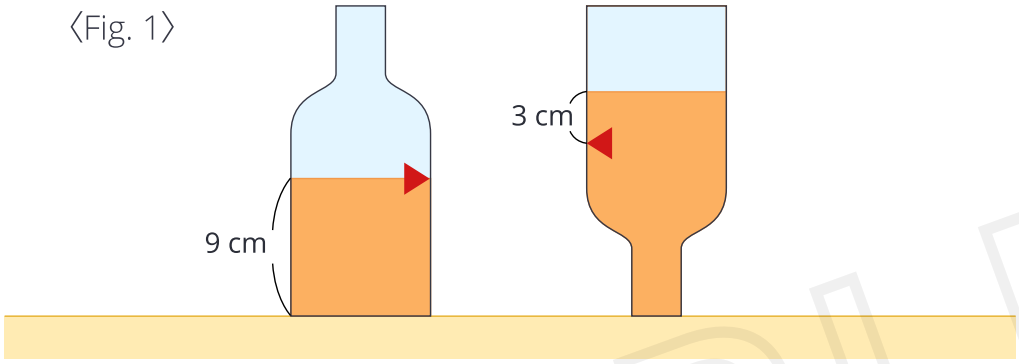
04 Juice Bottles

Question

Juice fills the bottle up to the red arrow, 9 cm from the bottom.

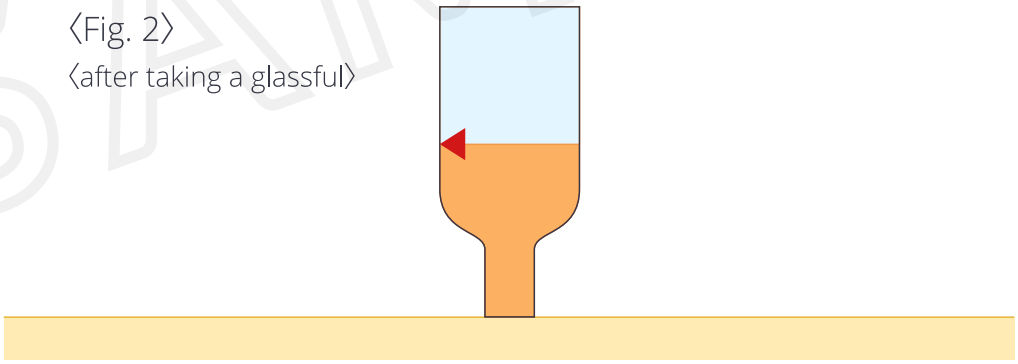
When you turn the bottle upside down, the juice comes to 3 cm above the arrow as Fig 1.

〈Fig. 1〉



Next, you take a glassful of juice from the bottle and then turn the bottle upside down. In this case, it fills up to the red arrow as Fig 2.

〈Fig. 2〉
〈after taking a glassful〉



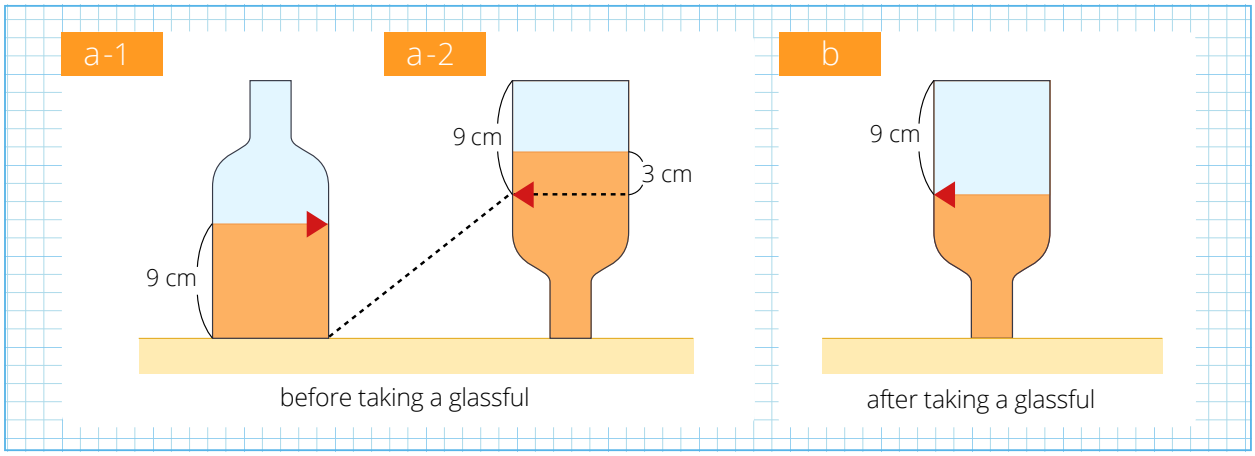
How many glasses of juice does this bottle hold?

Answer

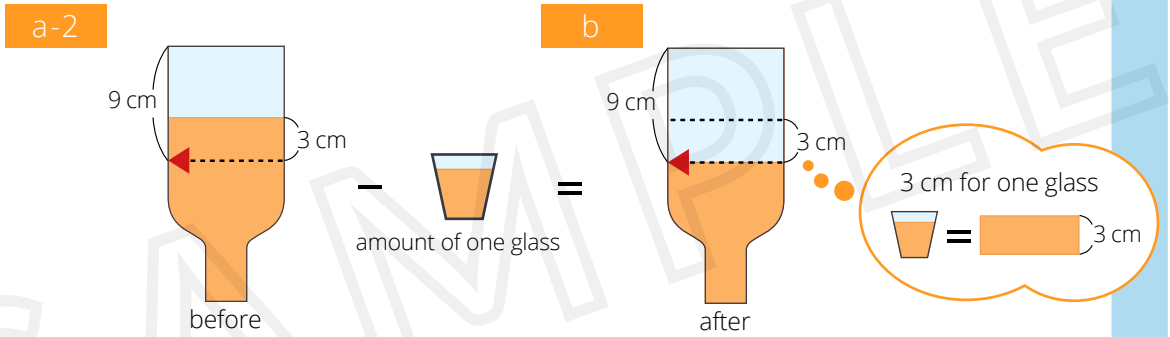
The answer is 5 glasses.

Go to the explanation!

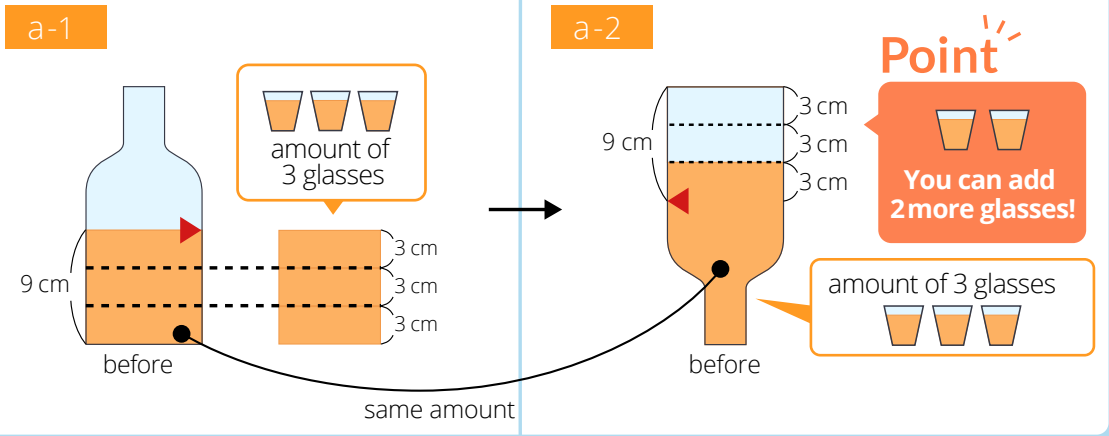
04 Explanation



Step ① How much is in a glass of juice?



Step ② How much juice/space was there in the bottle to start?



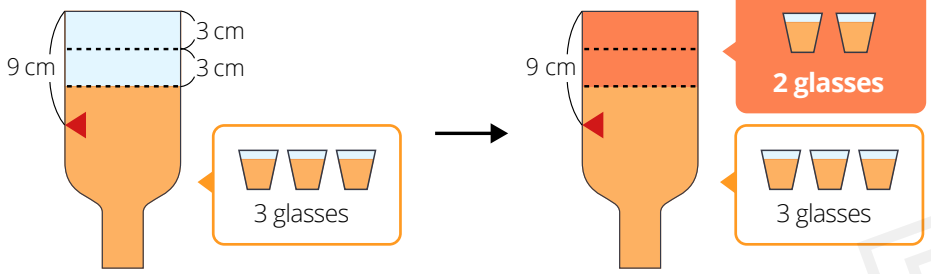
Move on! →

04 Explanation

Result

As in step ②, when you pour juice in the bottle [a-2] to fill it up...

a-2



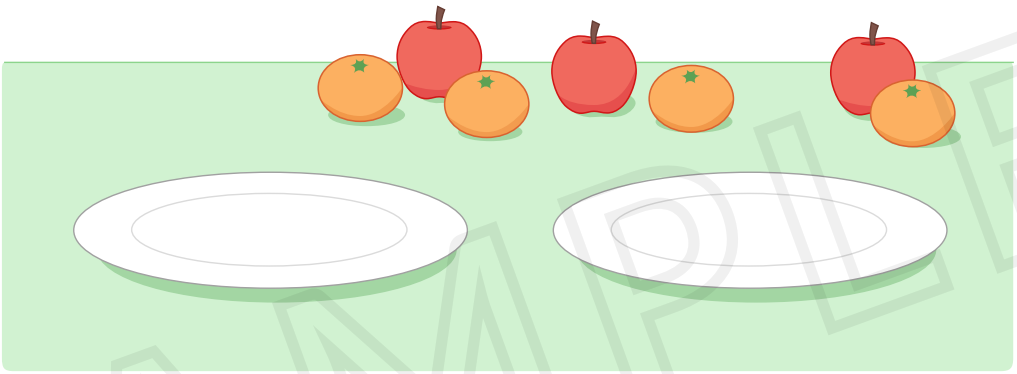
The bottle contains 5 glasses of juice.

Therefore, the answer is: **5** glasses

05 Apples & Oranges

Question

We have 18 apples and oranges altogether, and there are more oranges than apples.
Now we divide them into two groups of nine and put them on plates.
Both plates have at least one apple and one orange.
When one plate has seven apples on it, how many oranges do we have in total?



1 8 2 9 3 10 4 11 5 12

Answer

The answer is 3 10.

Go to the explanation!

05 Explanation

Read the question carefully, and solve the problem step by step.

Question

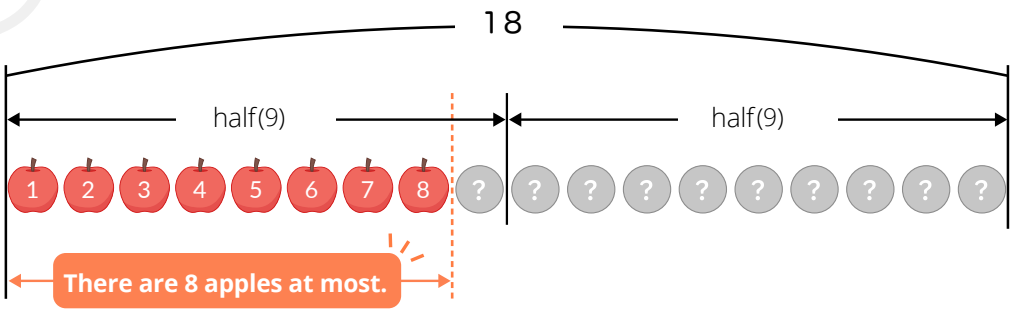
We have 18 apples and oranges altogether,
and there are more oranges than apples.

Let's stop here for now.

Now we divide them into two groups of nine and put them on plates.
Both plates have at least one apple and one orange.
When one plate has seven apples on it, how many oranges do we have in total?

Line all the apples and oranges up in a row.

Step①



There are more oranges... → There are fewer apples...
→ There are apples up to 8 !!

Move on! →

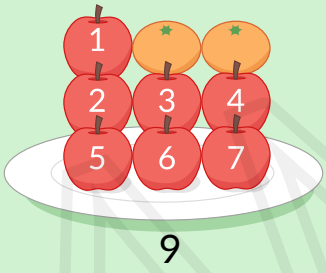
05 Explanation

Question

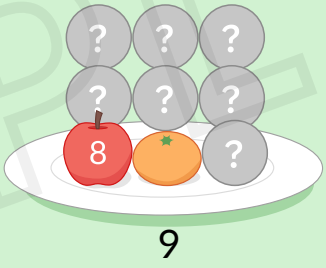
We have 18 apples and oranges altogether,
and there are more oranges than apples.

Now we divide them into two groups of nine and put them on plates.
Both plates have at least one apple and one orange.
When one plate has seven apples on it, how many oranges do we have in total?

Step②



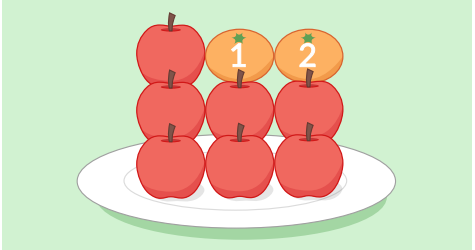
There are **7** apples out of **9**.
→ There are **2** oranges.

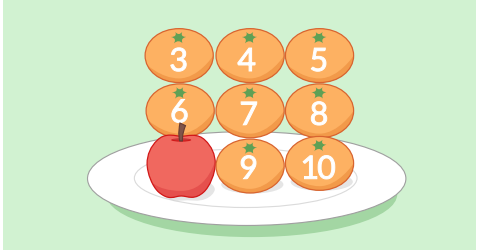


There is at least
one apple and one orange.

There are already 8 apples in total.

Result





So, there are 8 apples, and the rest are all oranges!

Therefore, the answer is " 1 10".