Puzzles

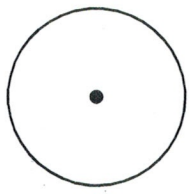
Note: "ODD" + "ODD" + "ODD" = "ODD"

1. Take 3 empty cups, and try to put eleven coins in them so that each cup holds an odd number of coins. All the coins must be used. Once you have solved this, try to put 10 coins in the same cups so that again each cup holds an odd number of coins and all coins are used. (Remember, Zero is an even number.)

11 coins: [1] [1] [9] 10 coins: [5] [5]

2. Using only one pencil, can you draw Figure 1 without taking the point of the pencil off the paper and without erasing any of your work?

Figure 1



This can be done by folding the paper.

3. There is a light in a storage room on the second floor of a building. On the ground floor are three light switches, exactly one of which controls the storage room light, which is a standard 100 watt bulb. By turning some or all of the switches on or off, it is possible to determine which switch controls the light by making two trips to the storage room. How?

Yes, check two swithes one by one if the light did not change it is the 3rd switch.

Can you determine this by making just one trip to the storage room? Outside the storage room, there is no way to determine whether the light is on or off, and disassembling the light switches will not reveal which one controls the light. All of the switches are in the off position to begin with, and you are not allowed to be helped by anyone.

Yes,
- turn one switch on → the light is on
- turn one switch on and wait 5 min. and then turn it off. → the light is off but still hot
- leave one switch off → the light is off

4. In Figures 2 and 3, there are cards with red backs(light) and blue backs(dark).

   In Figure 2, what is the minimum number of cards that you have to turn over to make sure that the following statement is true?

   Every card with a blue back has a 2 on the other side.

   In Figure 3, what is the minimum number of cards that you have to turn over to make sure that the same statement is true?

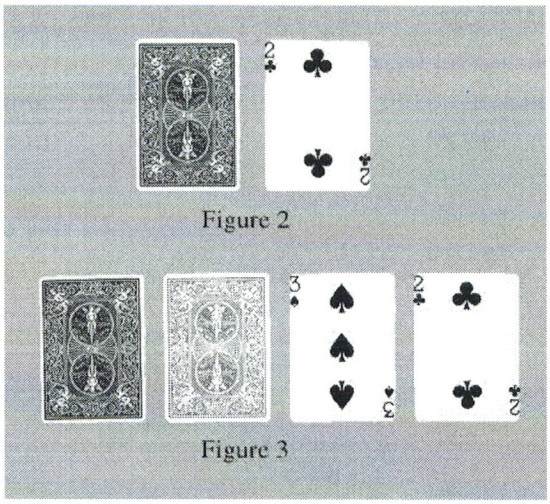


Figure 2

Figure 3

5. Two grade six classes were going on a field trip to a museum. They were being transported by two buses each of which had 34 seats. It so happened that there were 30 boys and 34 girls, and so they put all the boys on one bus and the girls on the other bus. The buses had to stop for a few minutes, and at that time several boys sneaked onto the girls' bus. But the girls' bus driver noticed that there were 10 too many on the bus, so he sent 10 children (boys and girls) back to the boys' bus. After this was done, were there more boys on the girls' bus than girls on the boys' bus? Or vice versa?

4. • In figure 2, we have to flip over the blue backed card. The minimum # is 1

• In figure 3, we agian have to flip the blue backed card. In addition, we have to flip the 3♠ to make sure it is not blue on the other side. The minimum # is 2

Note: if these cards are not from a "regular" deck of cards we should also check the red backed card. In this case, the minimum # is 3

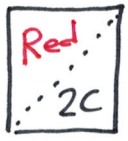
In mathematics we can represent:

"Every card with a blue back has a 2 on the other side"

as

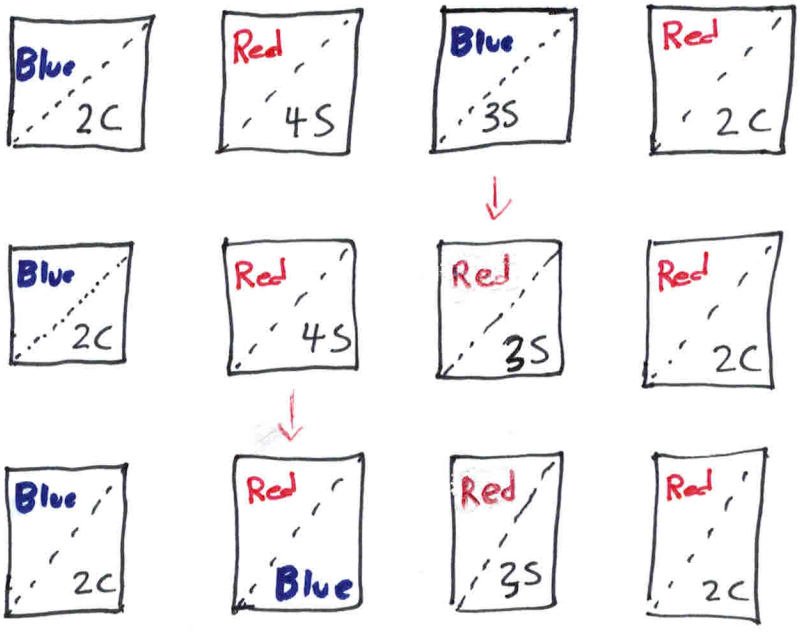
"blue => 2"

For figure 2 consider the following examples

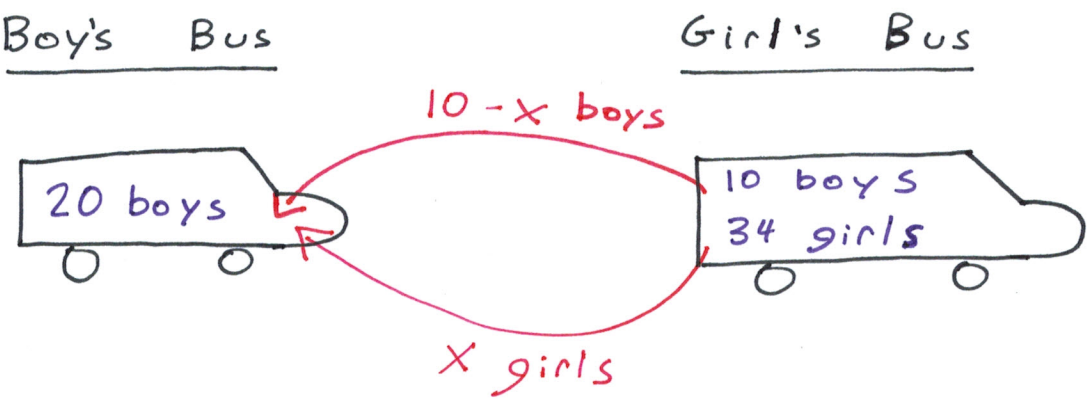
CARDS	Blue => 2
 	False (F)
 	True (T)

Notice that "blue => 2" is the same as "Not 2 => Not blue"

For figure 3 consider the following examples:

CARDS	Blue => 2	Not 2 => Not Blue
	F	F
	T	T
	F	F

5. The bus stops:



There are $10-(10-x)=x$ boys on the girls bus.

There are x girls on the boys bus.

∴ the #'s in the question are the same.