True or False?

Put a tick in the correct box and justify your answer.

(a) Melanie's hair is 300mm long. □ could be true □ can not be true

(b) Every week Lisa gets 50 pence pocket. If she saves, she can buy a new bike after one year. □ could be true □ can not be true

(c) Justus brushes his teeth daily. Every week he spends 70min brushing.

□ could be true □ can not be true

(d) One kilogram of hot hair balloons is lighter than 1000g of stones.

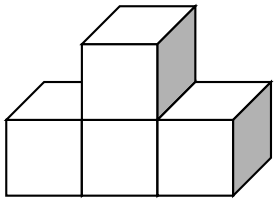
□ could be true □ can not be true

(e) There is a tree next to a two story house that is as tall as the house. The house has a flat roof. The tree is 20m tall.

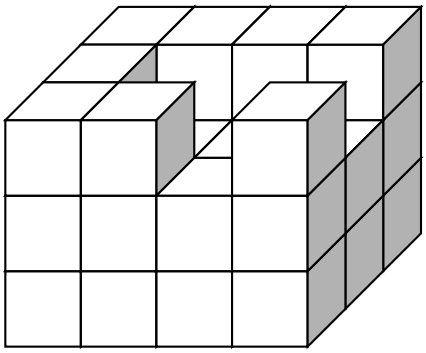
□ could be true □ can not be true

Cube quadruplets

A cube quadruplet looks like this:
It consists of 4 cubes of the same size glued together as in the picture on the right.



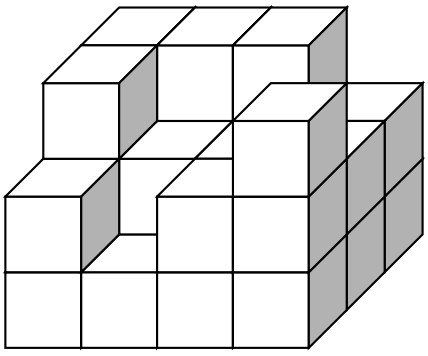
(a) Is it possible to complete the following construction to a rectangular box using the cube quadruplet?



Yes □

No □

(b) Is it possible to complete the following construction to a rectangular box using two cube quadruplets? Justify your answer.

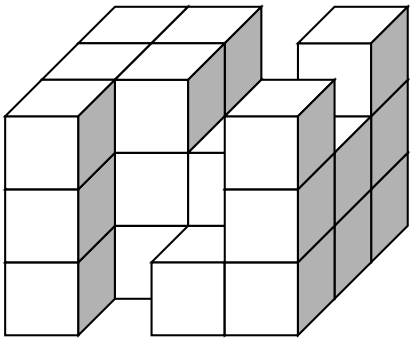


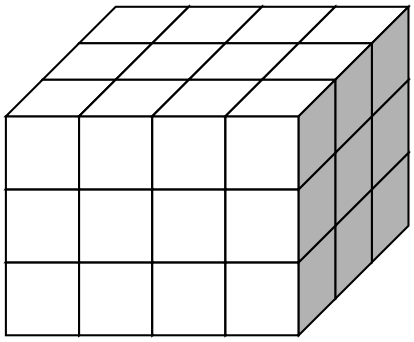
Yes □

No □

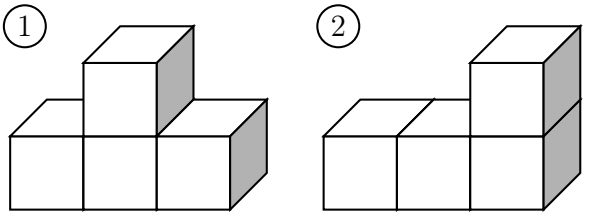
(c) Is it possible to complete the construction on the left using two cube quadruplets. If yes, draw the two cube quadruplets into the picture on the right with two different colours.

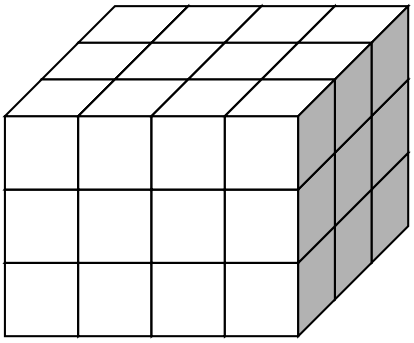
□ Yes □ No



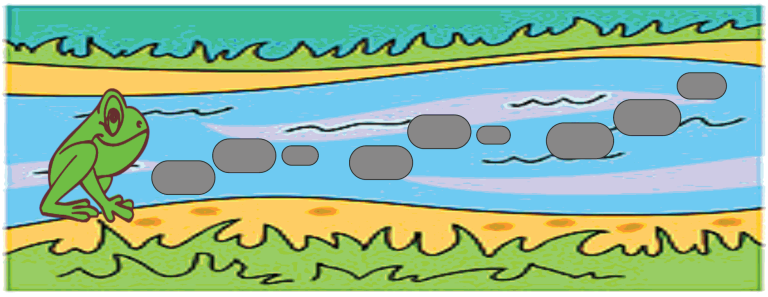


(d) Now you have two different cube quadruplets. You may use any of them as often as you wish. Is it possible to construct the rectangular box below? Justify your answer in writing or by drawing a picture.





The frog



A frog is sitting on one side of a river. He wants to jump to the other side. In the river there are 9 stepping stones he can jump on. He only jumps forwards. On his way across the river he jumps on exactly 3 stones and skips at least one stone at every jump until he reaches the other side.

(a) Give all possible ways the frog could have crossed the river. Give your solution in a systematic way.

(b) Which stones does the frog never jump on? Justify.

Numbers minus the sum of their digits

(a) Write down all possible 3 digit numbers whose digits are the numbers 2, 4 and 6 without repeating a digit.

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

(b) For each 3 digit number in (a) write down the difference of that number minus the sum of its digits. For instance, the sum of the digits of 216 is 2+1+6=9. So in this case you would write down 216-9 = 207.

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

(c) For each result in (b) compute the sum of its digits. Do you notice anything?