

Did you correctly visualise the woodblock puzzle?

Did you solve it? Are you smarter than an Uzbek in 3D?

Here's the solution to the woodblock puzzle - were you able to correctly draw a side view of the three-dimensional object?

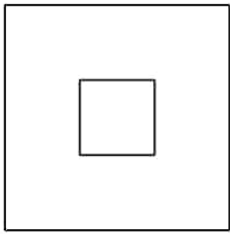
Alex Bellos

Mon 28 Sep 2015 12.10 EDT

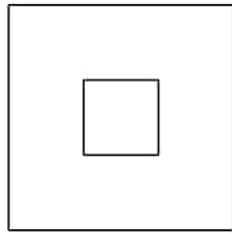
Earlier today I set you the following problem ([Click here](#) for the full question, spelt out in more detail):

The woodblock puzzle

Below are the top and front views of a three-dimensional wooden structure.



Top View



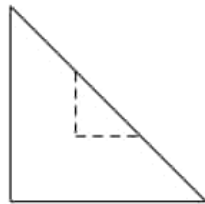
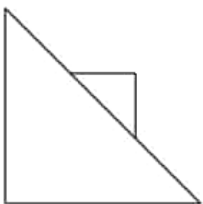
Front View

Please draw at least one left side view of the structure.

- 1 in which only wood with flat surfaces is allowed.*
- 2 in which wood with curved surfaces is also allowed.*

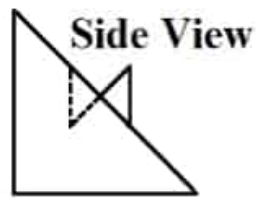
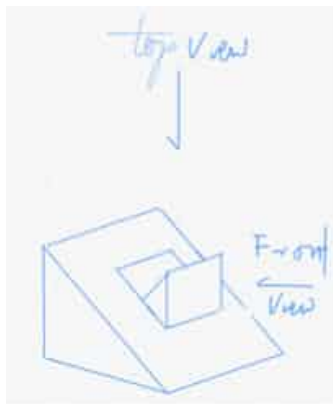
Solution:

Here are two solutions for part 1, when only flat surfaces are allowed:



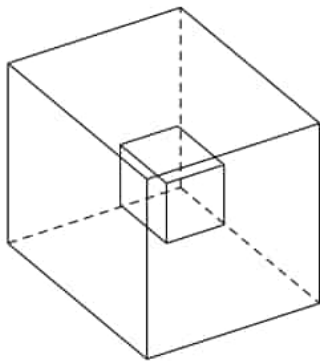
On the left, a prism sticks out. On the right, there is an indentation the shape of a prism.

I had thought these were the only two solutions - until I received the solution this morning from a reader called Anoop. I wonder if there are any more?



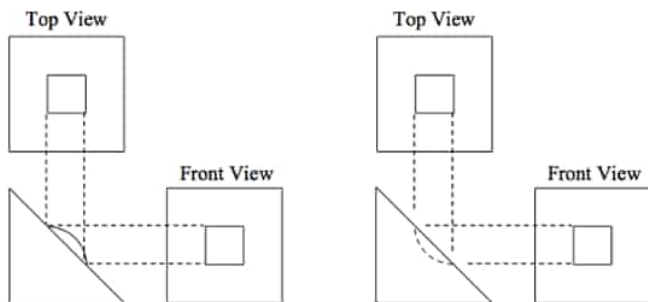
Anoop sent in the solution in blue (above left), which has the side view illustrated above right.

There are many other possible solutions that fail because the structure must be made of wood, and so every surface must be nonzero. Here is an excellent, and very creative incorrect solution: a transparent glass cube with a smaller opaque cube in the middle.



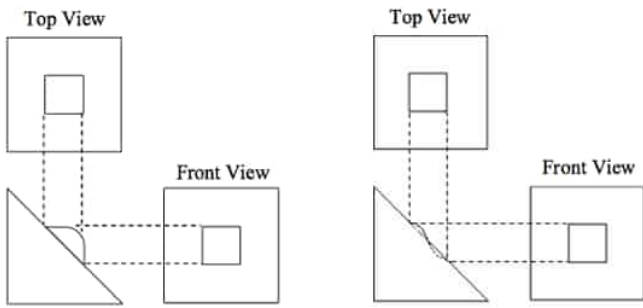
Nice try, but wrong.

For part 2, when curved surfaces are allowed, there are many solutions. Here are some of them. Did you get many, or indeed *any*?

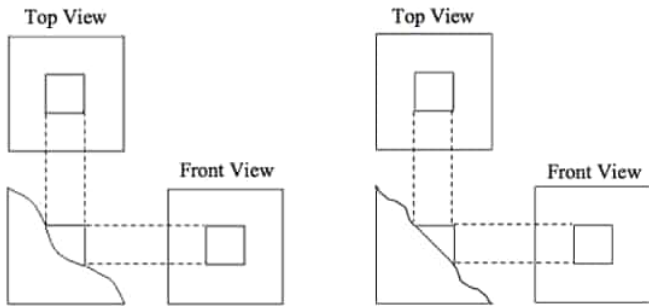


In these solutions the protruding (indented) part is not a section of a sphere but of a horizontal cylinder.

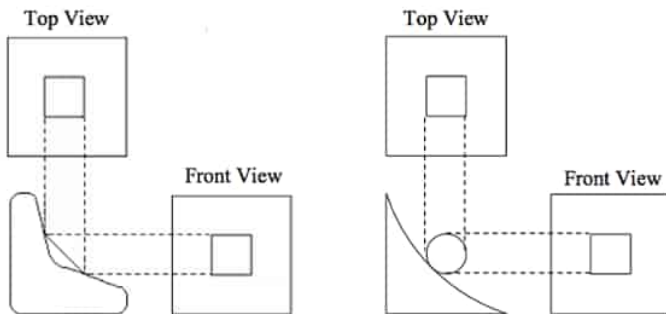
The curved wooden surfaces need to curve in certain ways, otherwise they may themselves produce extra lines. Here are some other solutions that work:



Variations on the above theme with different curves.

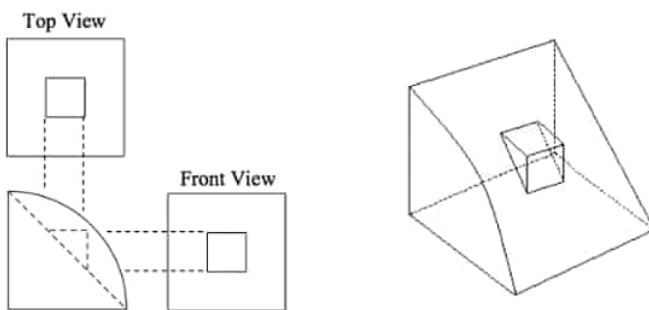


More variations.



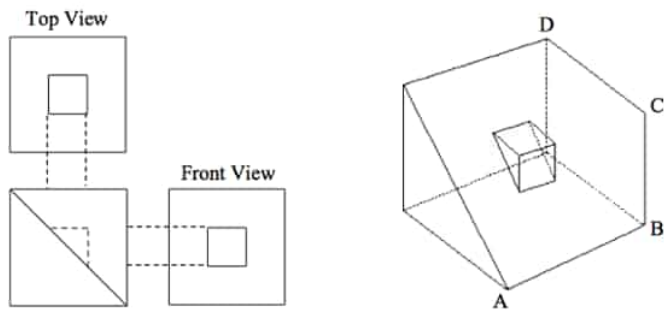
The circle in the top right solution does not denote a sphere but a cylinder. It is assumed that it can be stuck on in this way!

The following two solutions are more challenging to visualise:



Starting from the edge that is the hypotenuse of the right-triangular side, the surface starts flat before smoothly curving until it reaches the circular arc.

The solutions here are mostly by Alisher Ikramov of the National University of Uzbekistan. The next one is his most brain-stretching solution. The surface will move upwards from AB, curve inwards from BC and curve downwards from CD in such a way that there is no sharp line on the curved surface.



A real brain-stretcher of a solution.

When the question went up this morning, many people posted their solutions on social media. I particularly liked these pleasing, space-age designs by Phin Harper, deputy director of the Architecture Foundation. I think architects found this puzzle quite easy!

Now I know why!

If you have other solutions than the ones above, *send them in*.

I post a puzzle here on a Monday every two weeks. If you like this sort of thing check out my other Guardian blog Adventures in Numberland. You can also check me out on Twitter, Facebook, Google+ and my personal website.

If you like gazing at mathematical images and colouring them in, my latest book, Snowflake Seashell Star: Colouring Adventures in Numberland, is out now.

And if know of any great puzzles that you would like me to set here, get in touch.

Since you're here ...

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