Date:_____ ID:_____

Cross Section Test

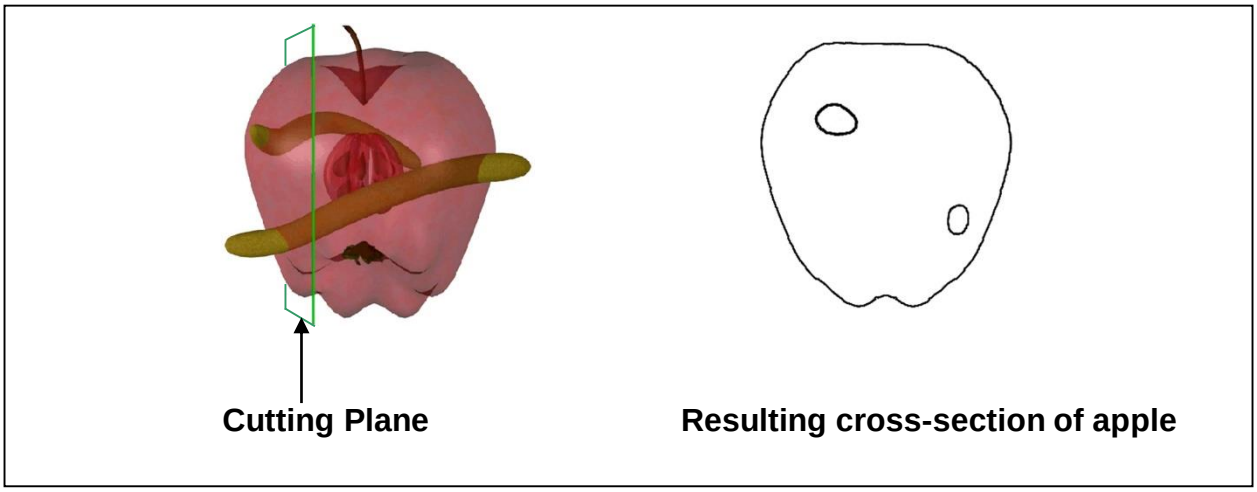
Version 4

(revised 03/30/18)

This is a test about **cross-sections**. A cross-section is the 2D shape that results when a cutting plane intersects an object.

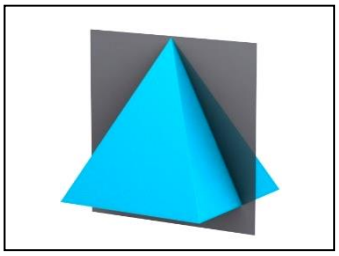
You've seen many examples of cross-sections in everyday life. For example, when you slice an apple from top to bottom, the resulting cut surface is a cross-section of the apple.

The picture below shows an apple with some worms inside. Note that the cross section on the right shows both the apple and the shapes and locations of the sliced worms inside the apple.

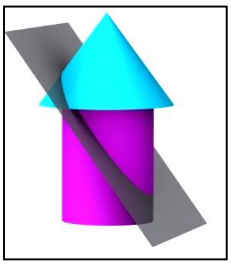


For assistance with revisions, thanks to:
Rabih Younes, Duke University
Uri Alon, University of Haifa
The Center for Safety, Simulation & Advanced Learning Technologies, University of Florida

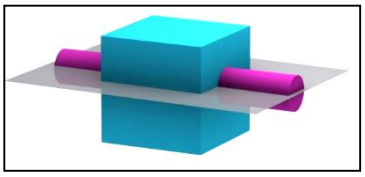
In this multiple choice test, you will be asked to identify the cross sections of three types of figures:



Single object



Attached objects

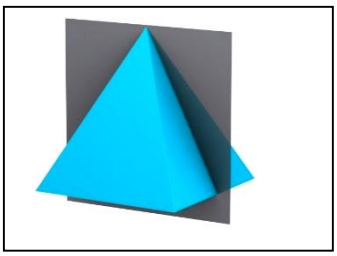


Nested objects
(one object is inside another)

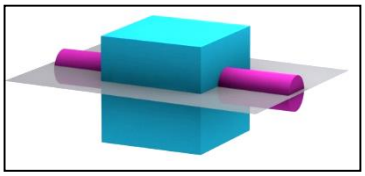
Here are some important things to remember:

- All figures are solid (not hollow) objects.
- The objects are about 6-8 inches tall. Imagine that they are on the table in front of you.
- Attached figures are “glued together” at their edges.
- Nested objects consist of one object inside another. In the nested object above, the cylinder extends all the way through the cube. If you sliced this figure, you would see the cylinder inside the cube.

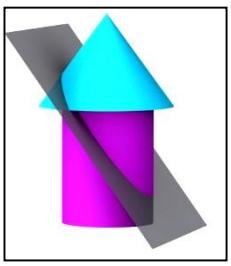
The cutting planes, shown in grey, will have different orientations.



Vertical Plane



Horizontal Plane



Oblique Plane

You will see three types of cutting planes: horizontal, vertical, and oblique.

For each type of cutting plane, try to imagine the cross section that would result if you faced the cutting plane head-on, as if you were looking at your reflection in a mirror.
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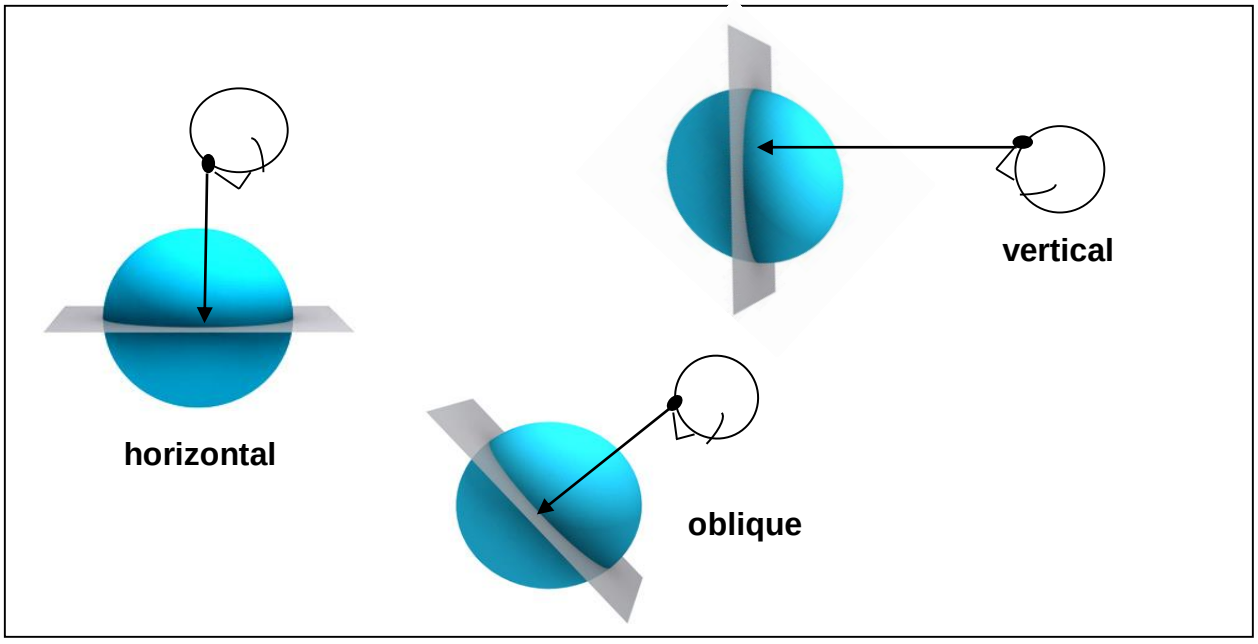
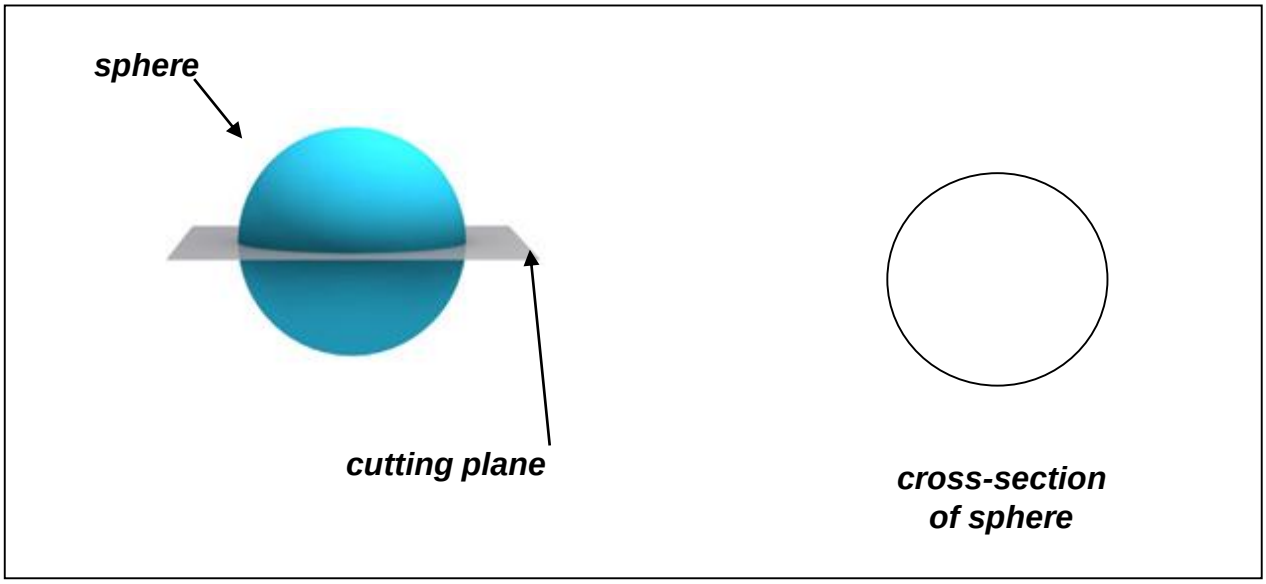
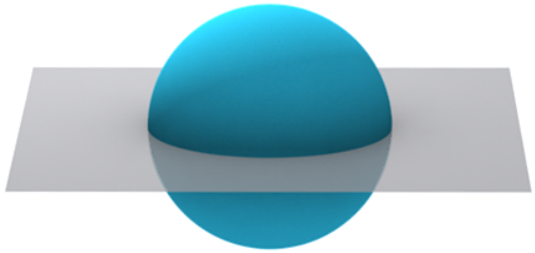


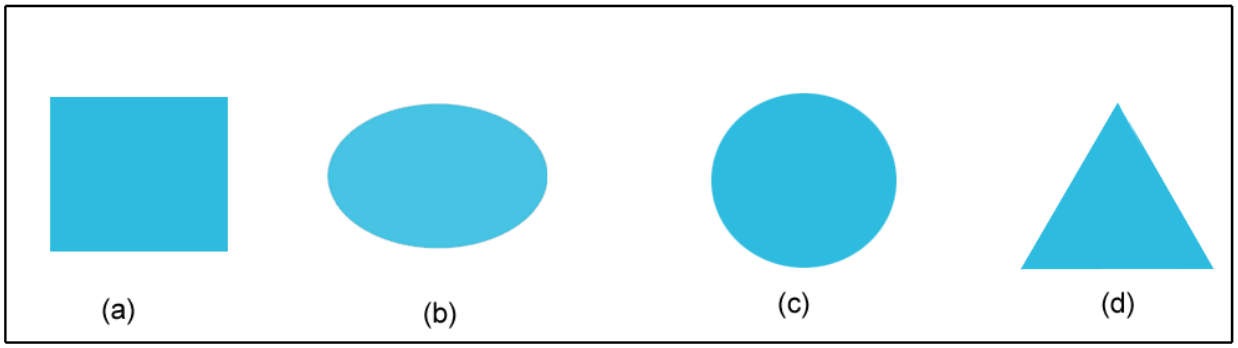
You should also assume that the objects are 6-8 inches tall, and that they are sitting on the desk in front of you.

In the example below, the cutting plane would produce the cross section on the right.



Sample Problem



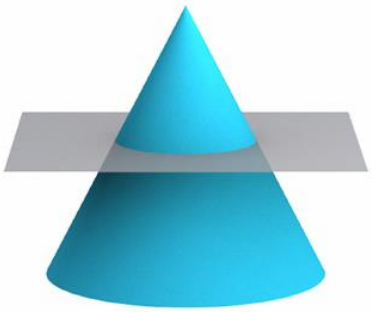


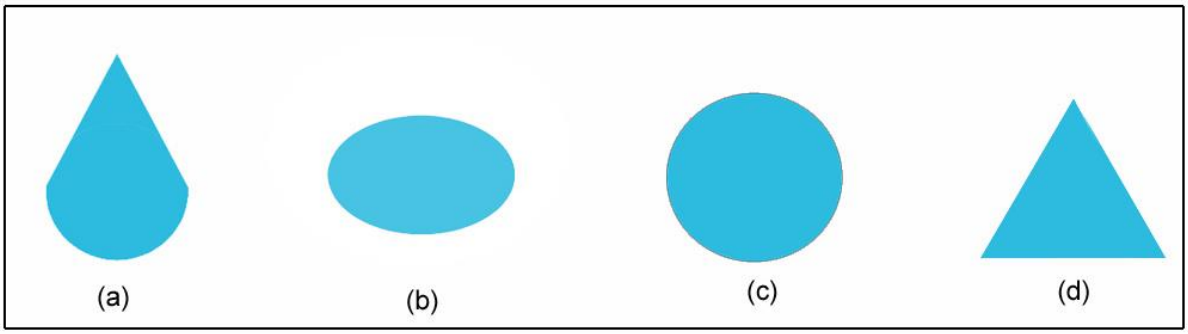
Instructions:

Circle the cross-section you would see when the grey cutting plane slices the object. Imagine that you are facing the cutting plane head-on, as if you were looking in a mirror. Make your choice based on the shapes of the possible answers, not their sizes.

This is an untimed test. Work at your own pace.
You can ask the experimenter a question at any time.

Problem 1





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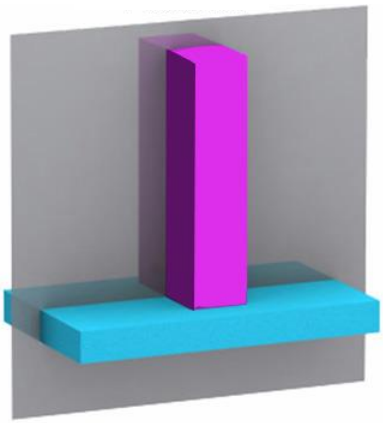

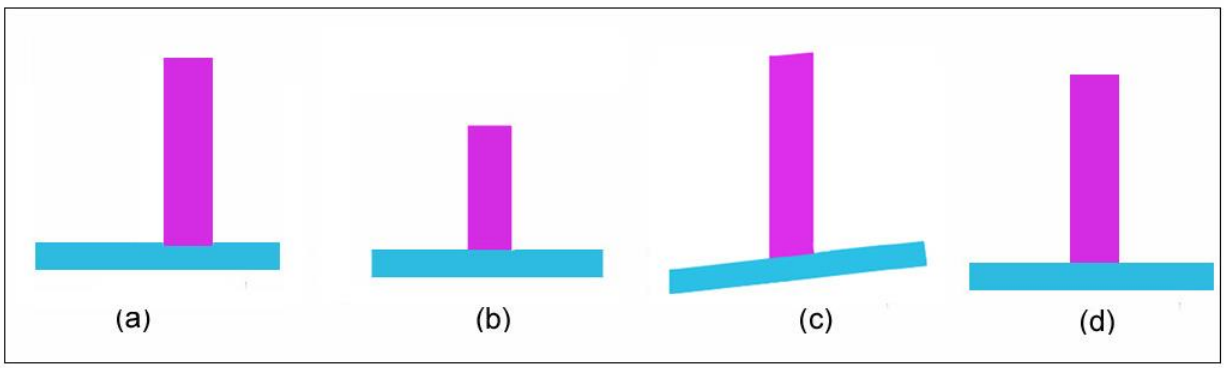

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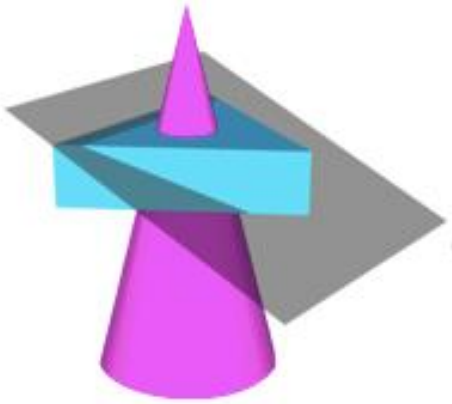

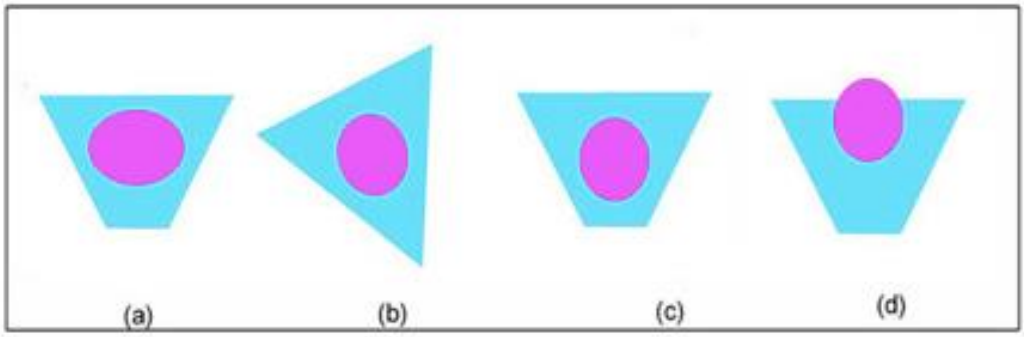

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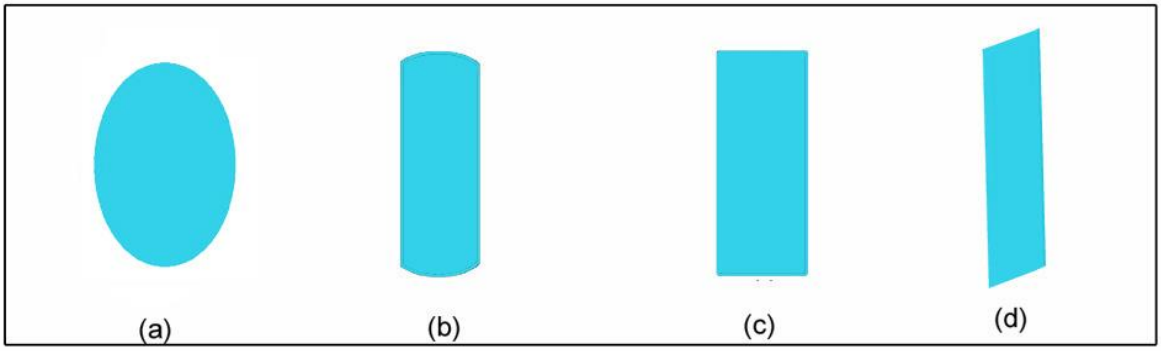

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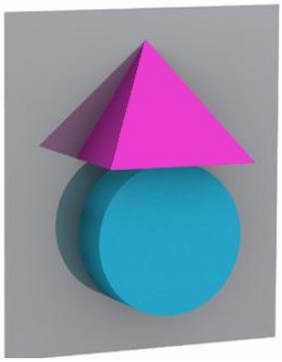

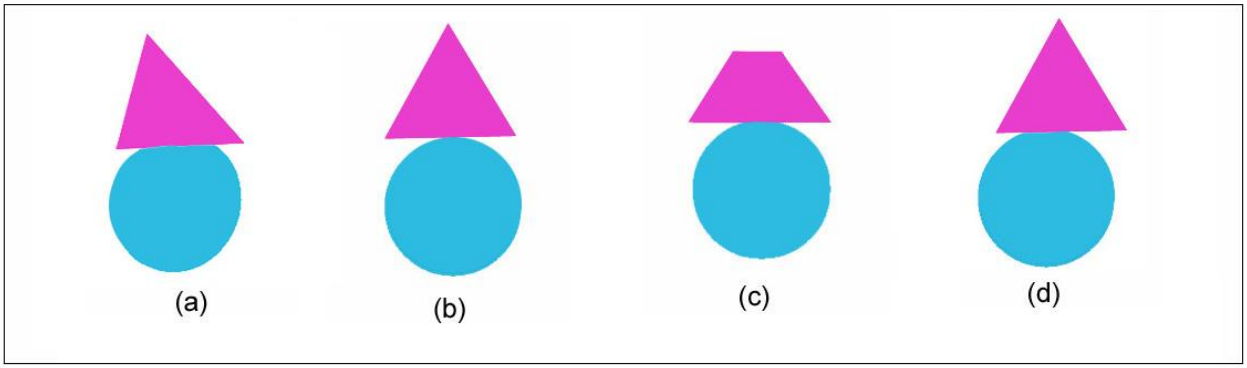

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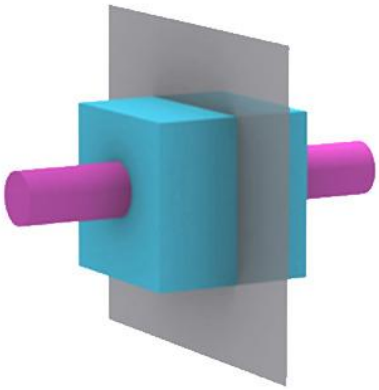

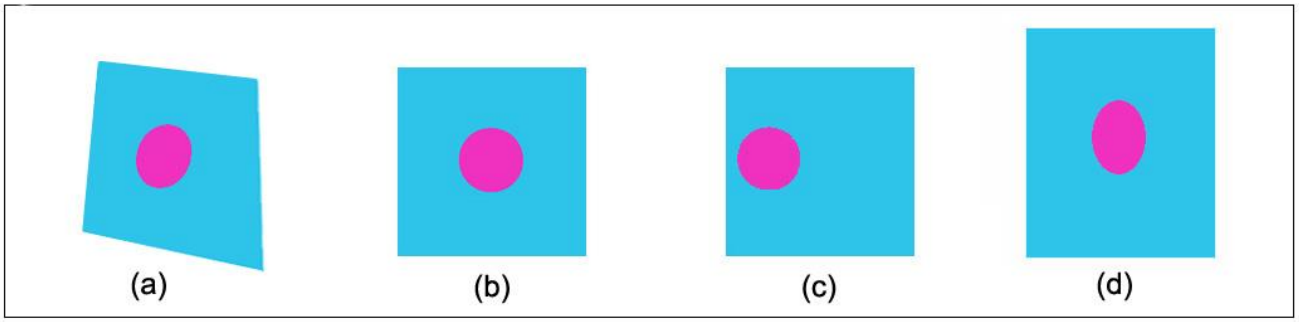

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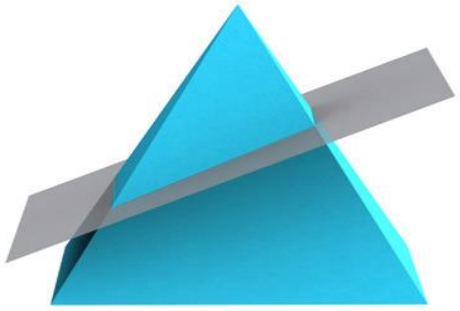

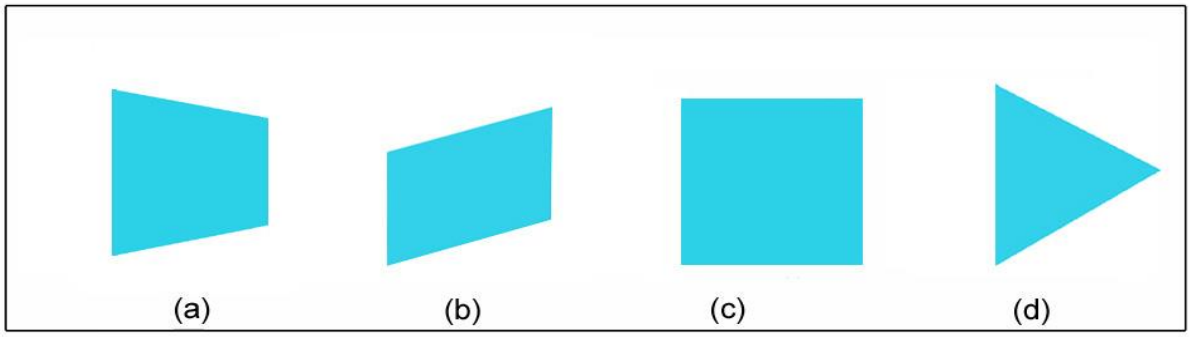

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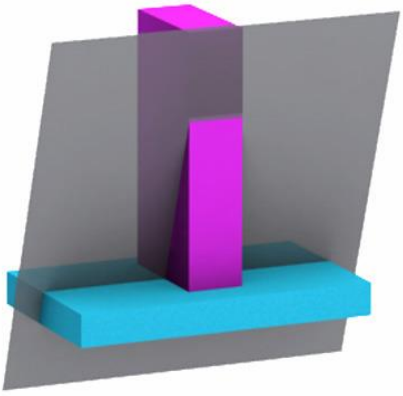

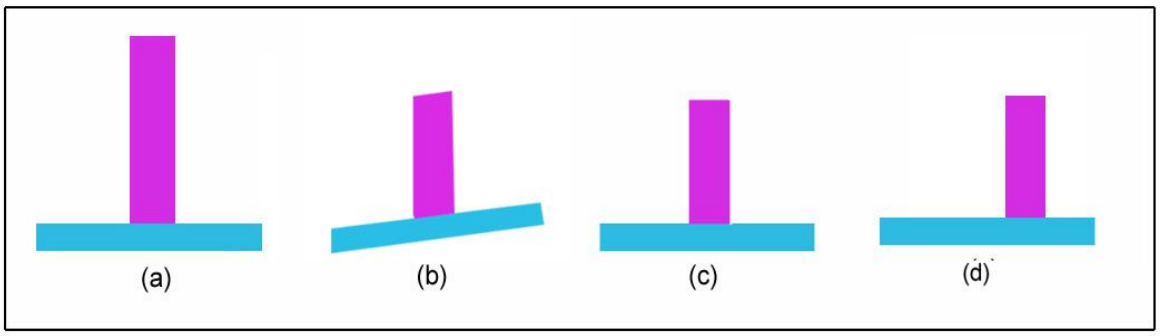

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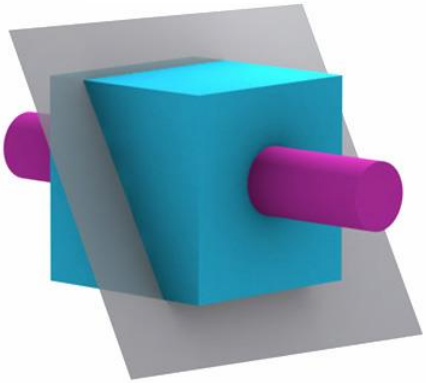

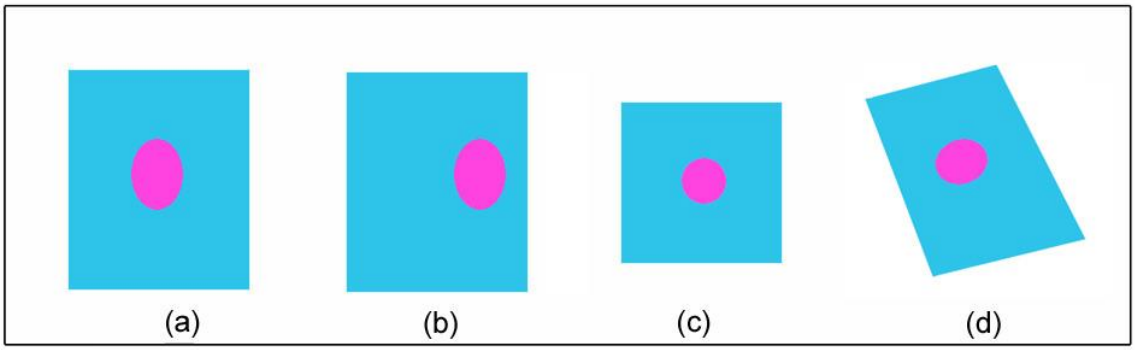

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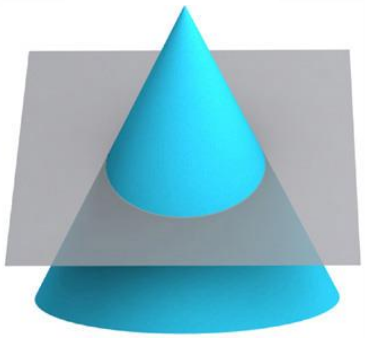

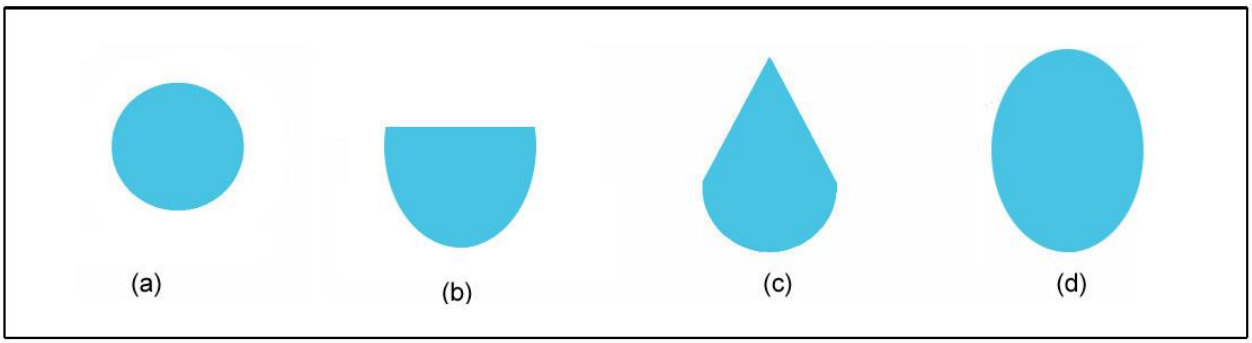

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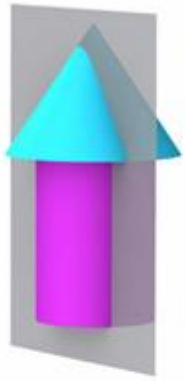

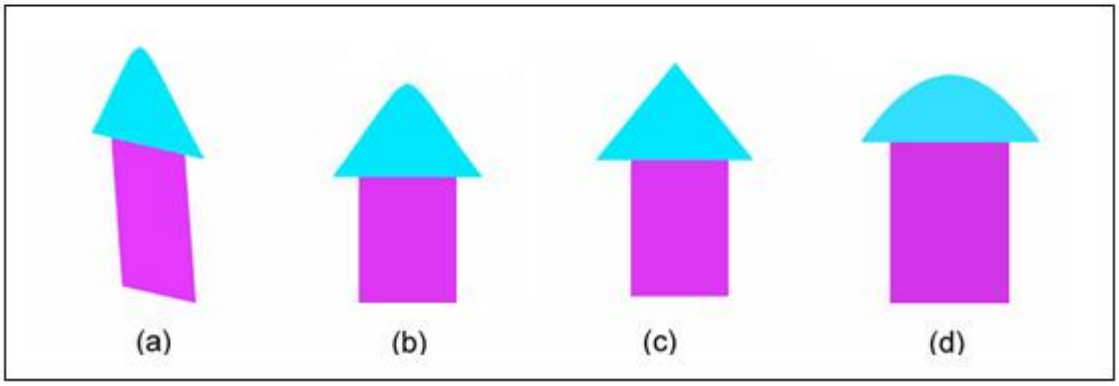

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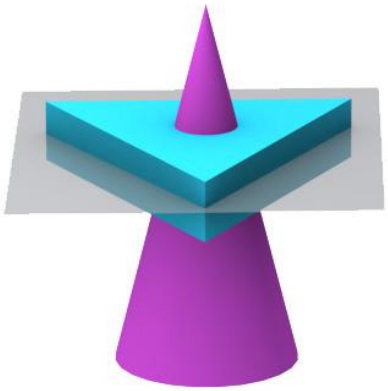

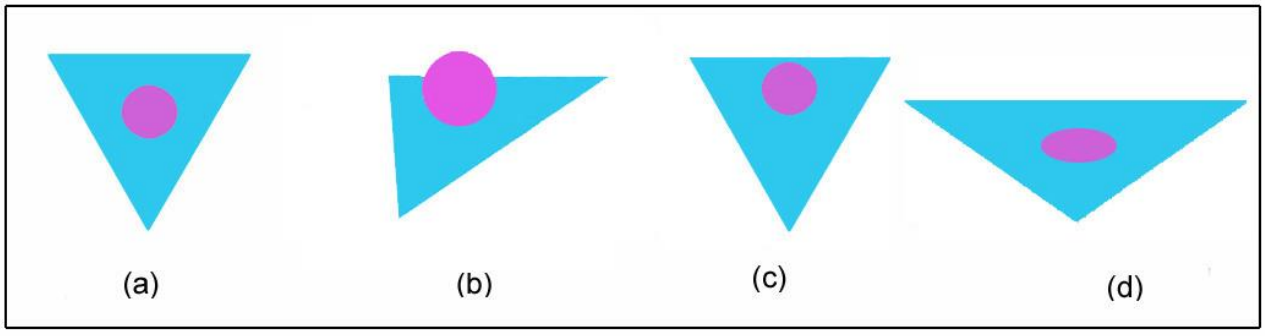

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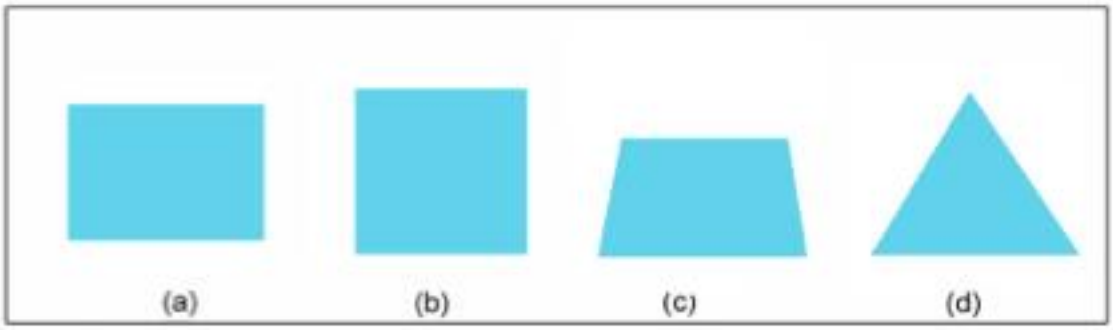

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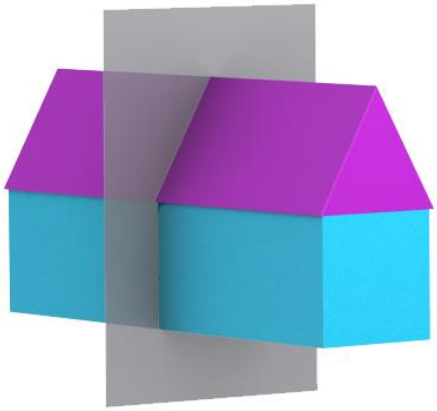

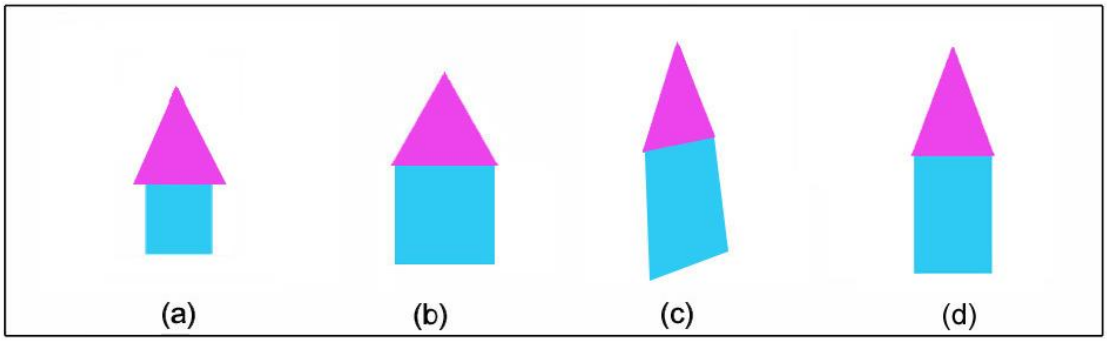

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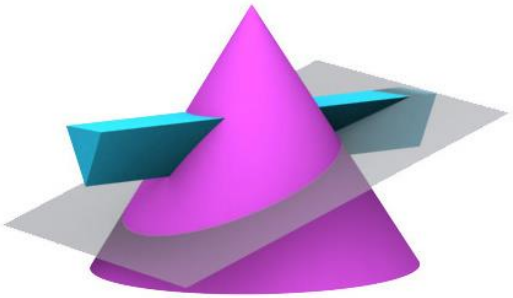

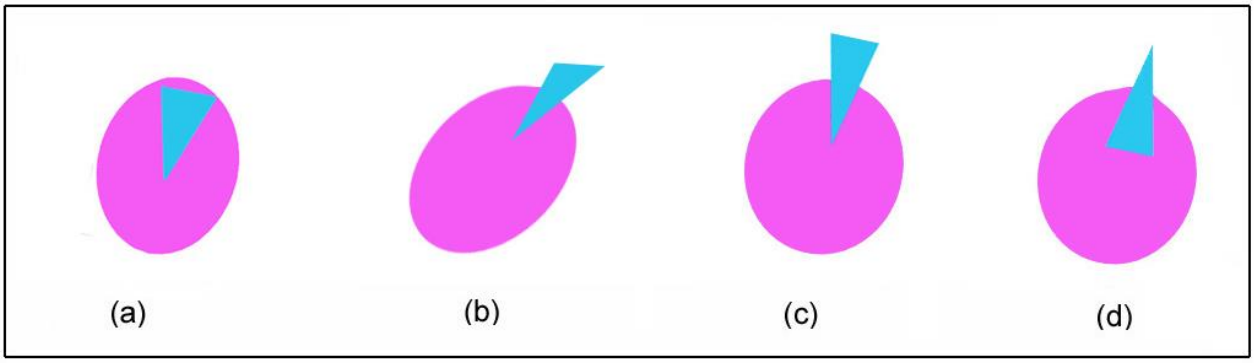

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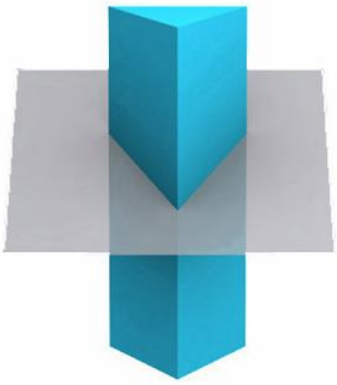

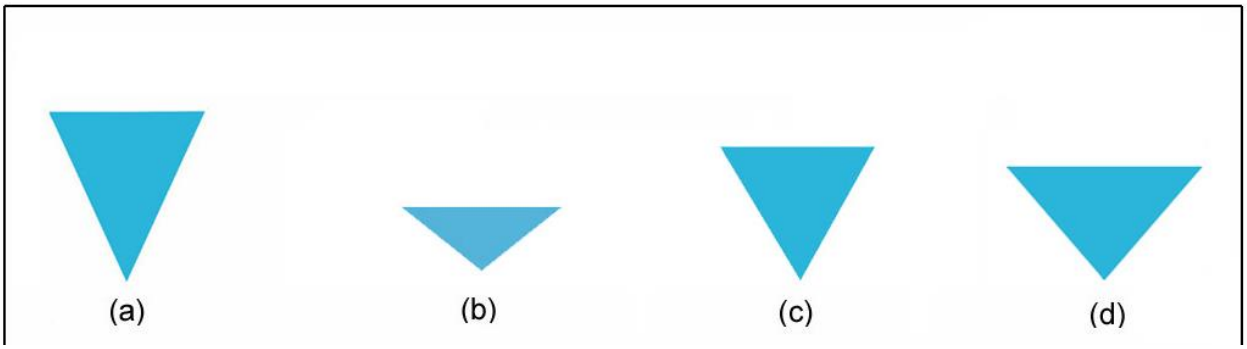

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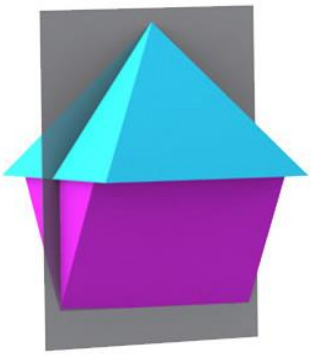

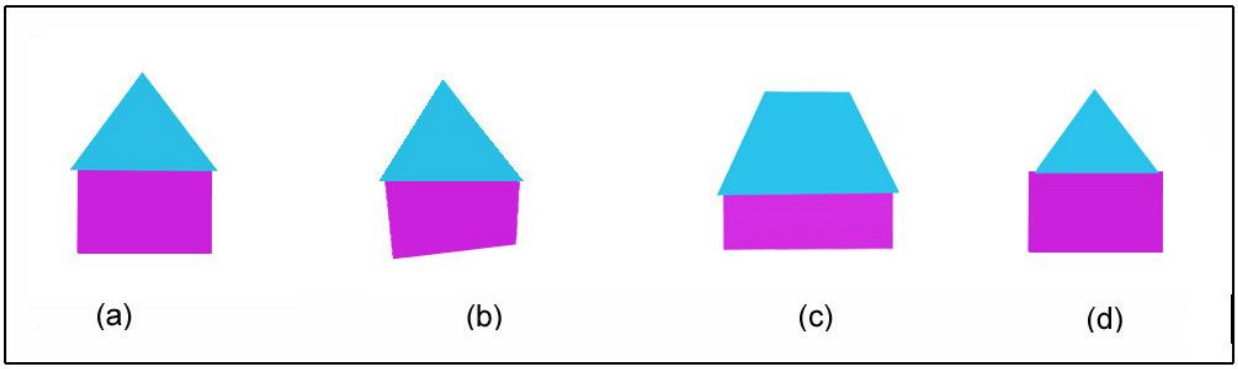

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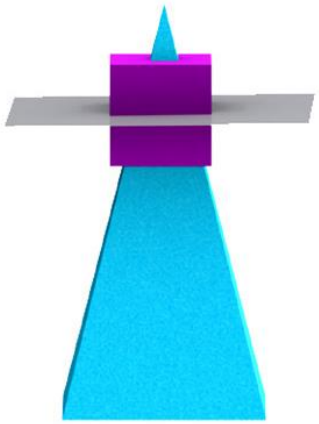

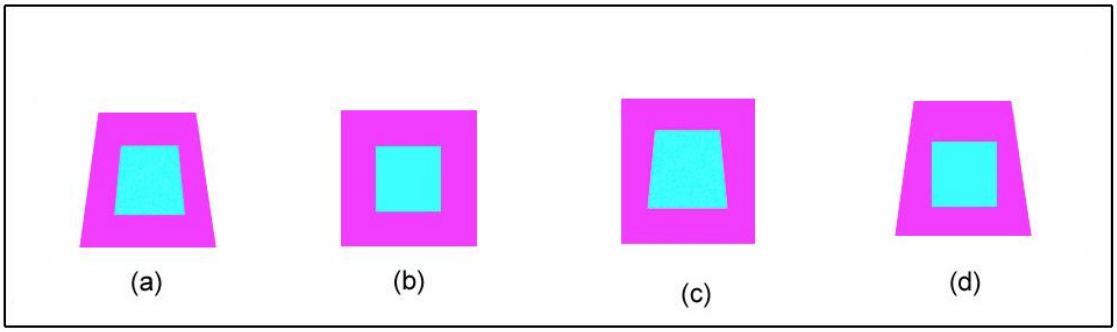

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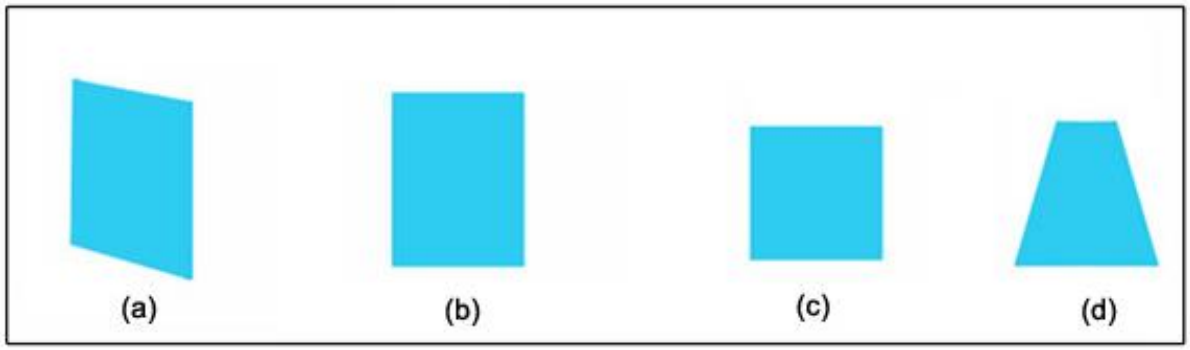

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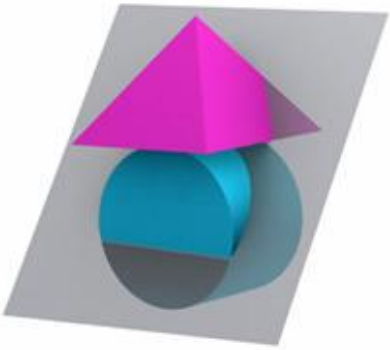

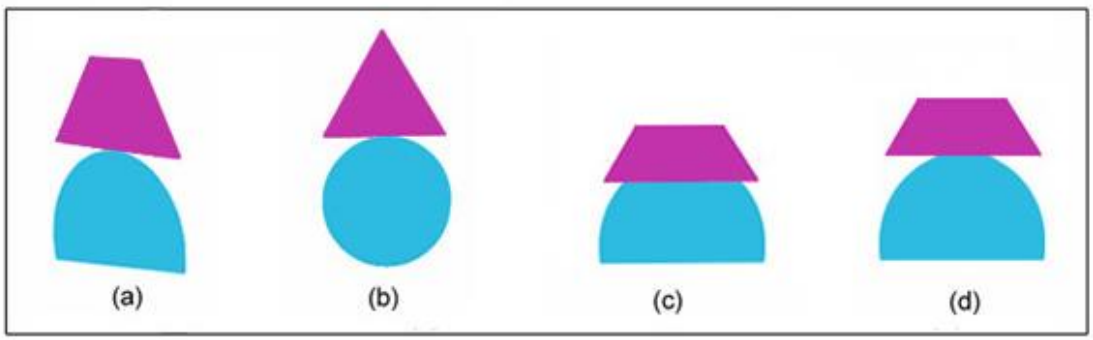

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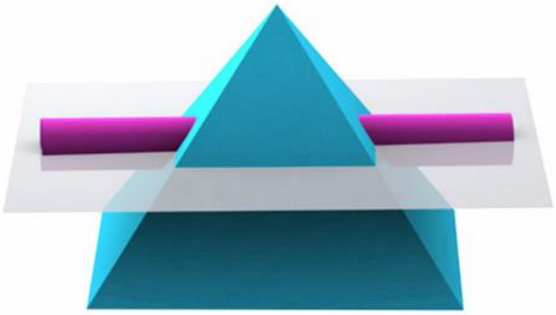
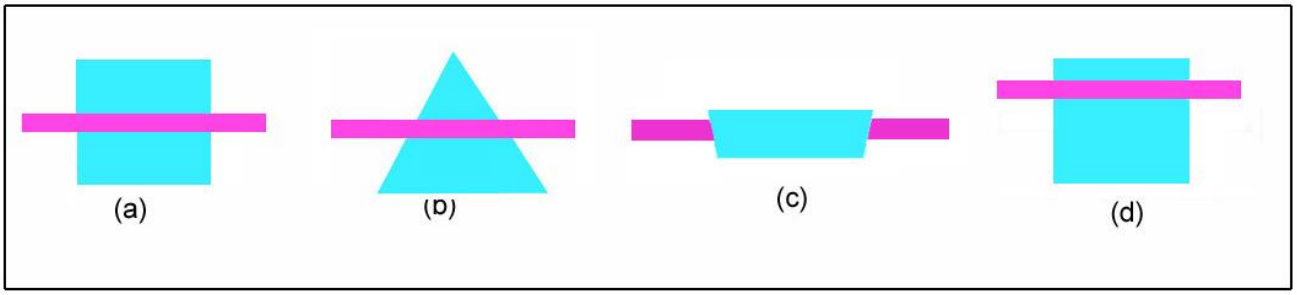
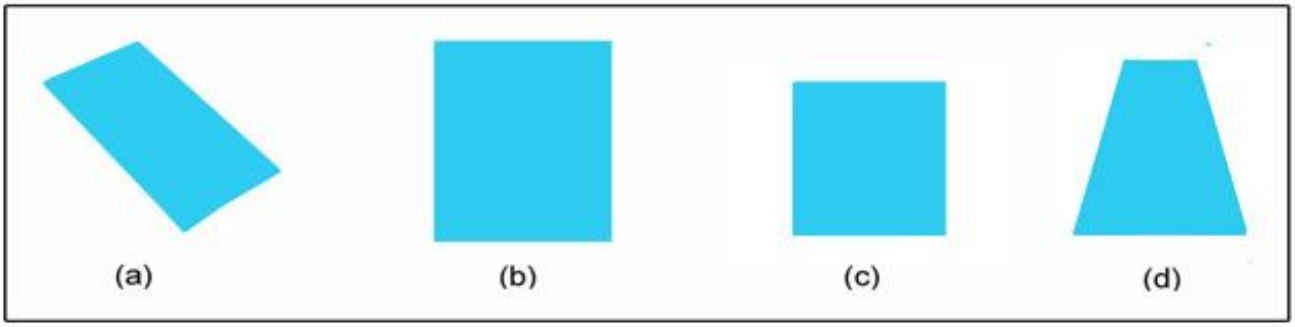
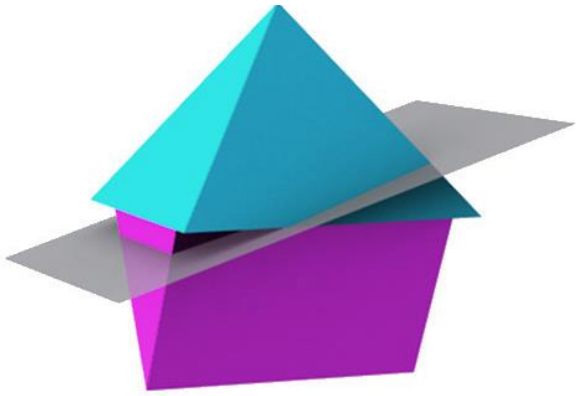


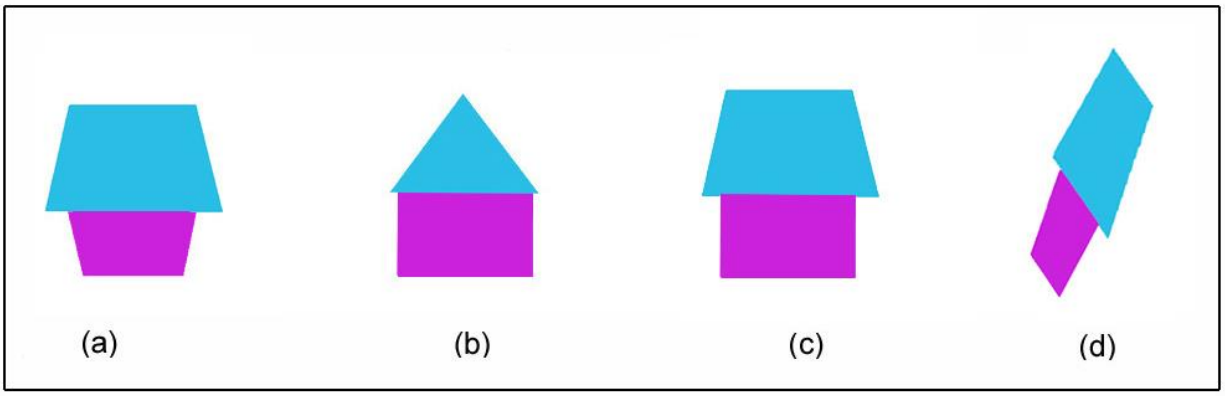


Problem 22

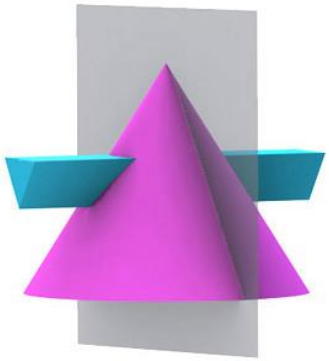


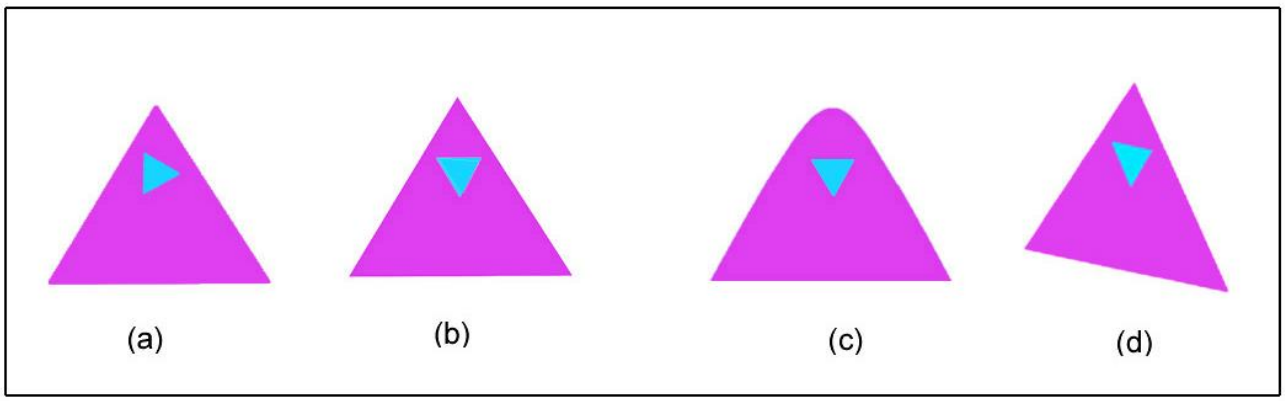
Problem 23



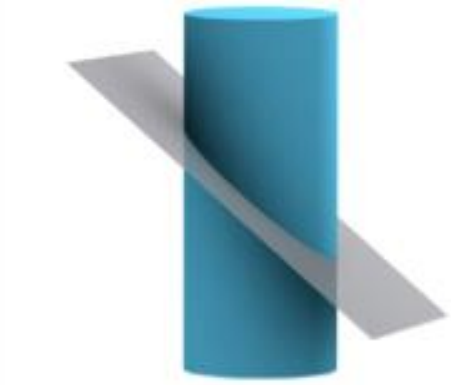


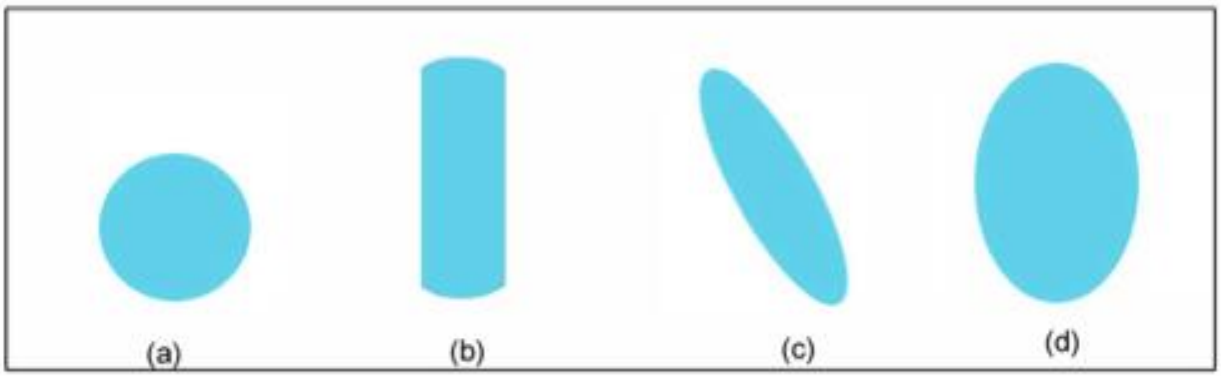
Problem 24



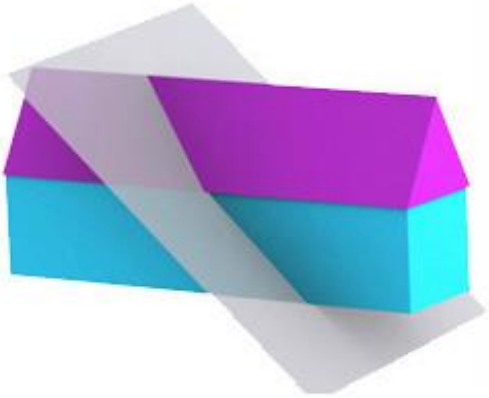


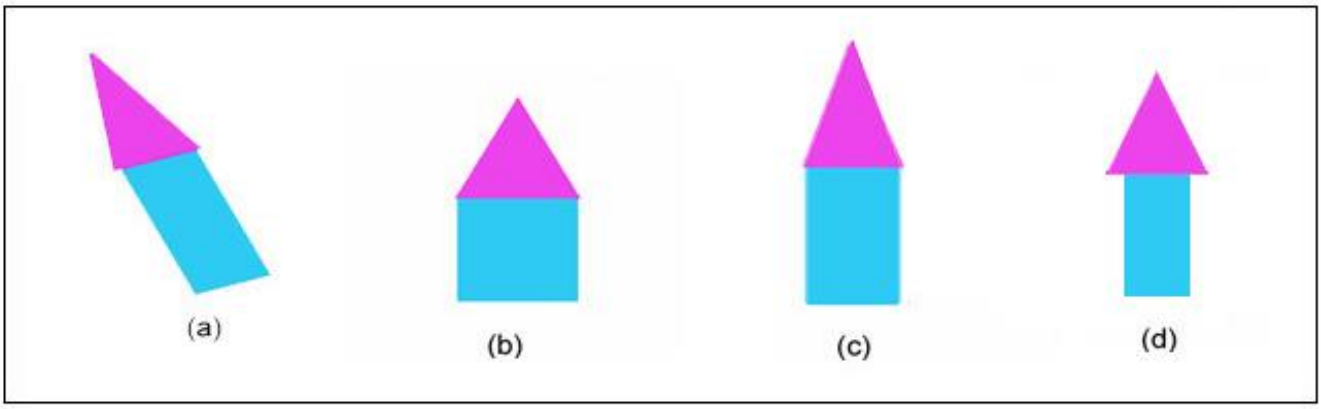
Problem 25



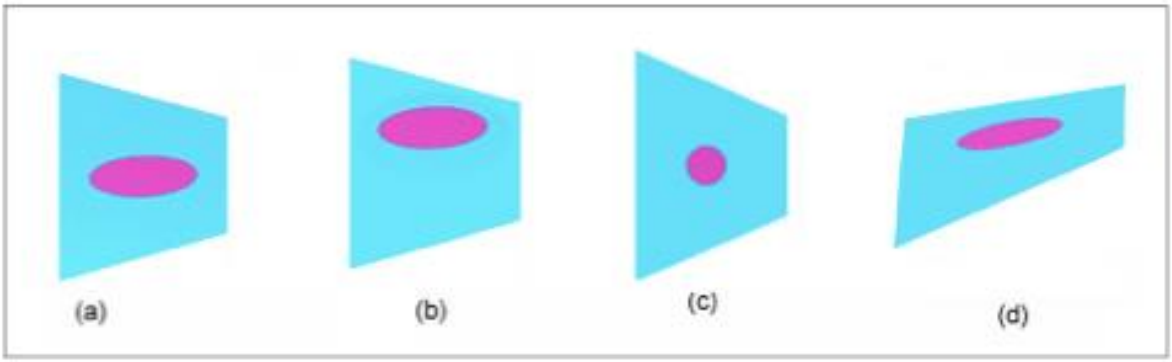


Problem 26

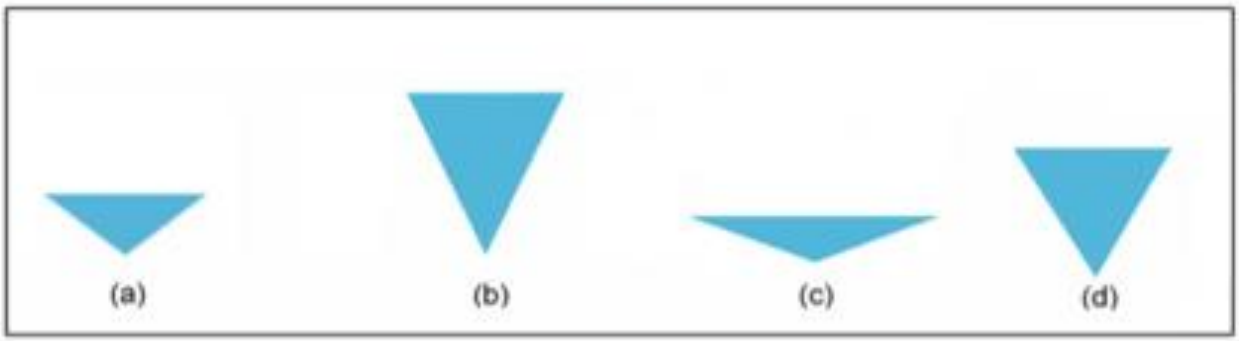




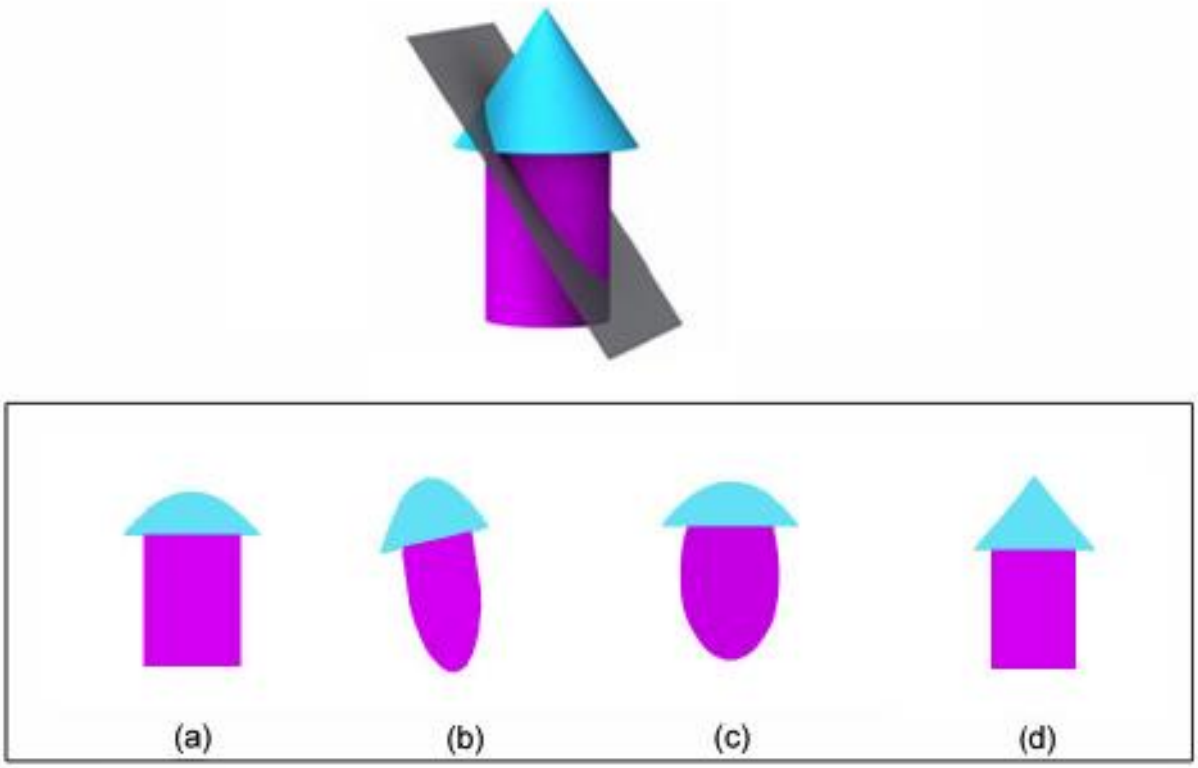
Problem 27



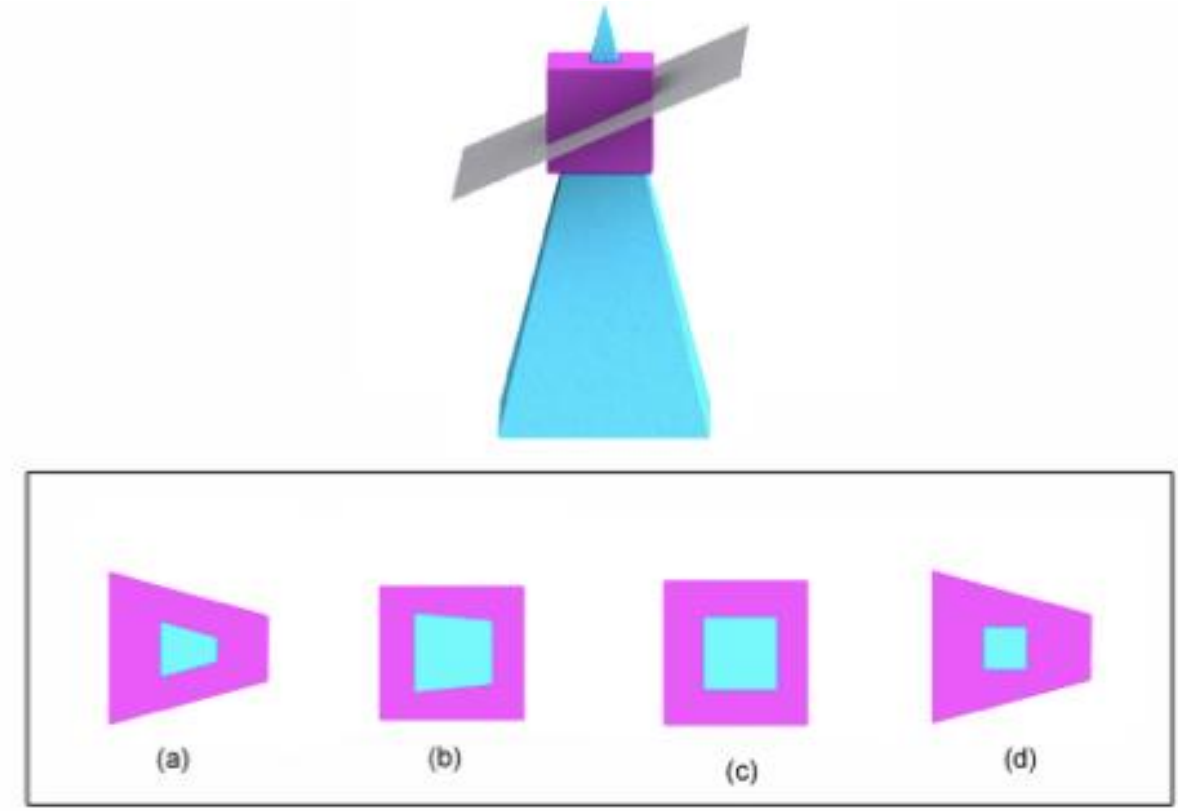
Problem 28



Problem 29



Problem 30



End of test