



---

**Grade 7/8 Math Circles**  
**February 29th, 2012**  
*Spatial Visualization and Origami*  
**Solution to the Exercises**

Examples 1-9 can be verified by folding and cutting a piece of paper as instructed.

Example 10 can be verified by turning a Rubix Cube clockwise on the three sides.

A lot of these exercise can be checked by drawing, folding or cutting paper as instructed. Here, I give brief explanation to some questions

Exercises:

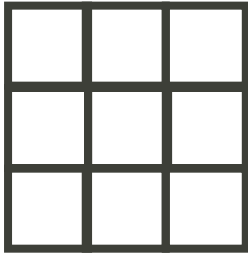


2. 9:25
3. Two arcs on a circle enclosed by any 2 chords of the same length have the same length.
4. No, the 2 dots on the right face should be reflected across the horizontal line or vertical line of that face.
5. No, the front face should be the right face and the right face should be the front face.

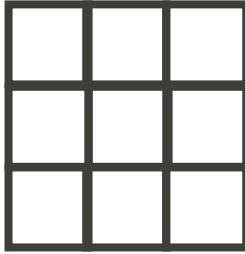
Remember, you can check your own answers to questions 4 and 5 by making a cube from the assemble diagram.

6. Yes.
7. E

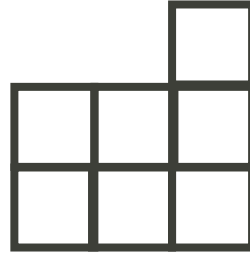
Front



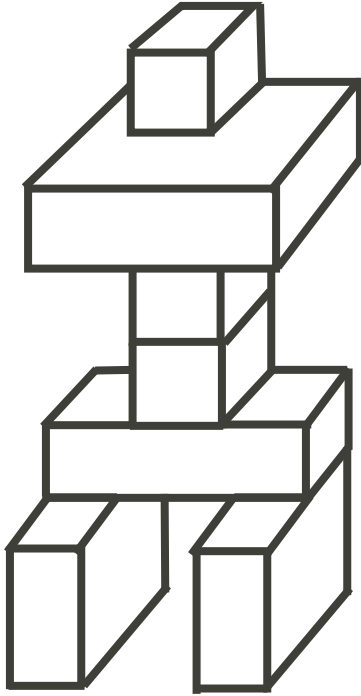
Top



R.Side



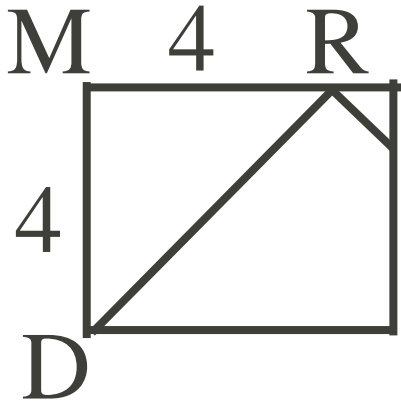
8.



9.

10. Area of  $DRQC = \text{Area of } ABCD - \text{Area of } AQB - \text{Area of } ARD$

$BP = AQ = 5$ ,  $AD = 8$ , and if you fold the paper vertically in half at  $R$ , you will see that  $RM = MD = 4$ . So the area of  $AQB$  is  $(5 \times 5) \div 2 = 12.5$ , and the area of  $ARD$  is  $(4 \times 8) \div 2 = 16$ . So the area of the quadrilateral  $DRQC = 5 \times 8 - 12.5 - 16 = 11.5$



Kirigami exercises can all be verified by folding and cutting the paper as instructed.