



Problem 1 – Triangles

Open a new *Cabri™ Jr.* file.

1. Construct a scalene triangle and measure its angles. Find the midpoint of one side. Use the **Symmetry** tool to create a tessellation.

Make a sketch of your triangle tessellation.

2. Drag a vertex of the original triangle. Does it matter what type of triangle (equilateral, isosceles, scalene) you use to create the tessellation?

3. How many angles come together at one vertex of the tessellation?

4. List the measures of all the angles that come together at one vertex of the tessellation.

5. Find the sum of the angles at one vertex of the tessellation. Will you get the same result regardless of the shape of the initial triangle? Explain why or why not, using theorems about angles and lines.



Problem 2 – Rectangles

Use the file *RECTNGL* to tessellate rectangles using different transformation tools. Save and give each part a new name. You may drag a vertex of the rectangle to adjust its dimensions.

6. Save the file with the name *RECTREFL* and use the Reflection tool. Make a sketch of the tessellation.

7. Save the *RECTNGL* file with the name *RECTTRAN* and use the Translation tool. Make a sketch of the tessellation.

8. Save the *RECTNGL* file with the name *RECTTRX*. Construct the midpoint of each long side of the rectangle. Create two diagonal segments and use the **Translation** tool. What pattern will result?

9. How many angles come together at one vertex of the tessellation for the cases in Questions 6, 7, and 8?

10. Find the sum of the angles at one vertex of the tessellation for each of those cases.

11. Save the *RECTNGL* file with the name *RECTROT* and put the number 90 on the screen. Use the **Rotation** tool. Try to construct a tessellation. Is it possible to construct a tessellation using rotation that covers the entire plane, regardless of the shape of the initial rectangle? Try to find a tessellation that is a repeating pattern of rectangles of both orientations, assuming the length is twice the width.

12. What other tools from the Transformation menu could be used instead of the **Symmetry** tool to create the same result?



Problem 3 – Quadrilaterals

13. In a new *Cabri Jr.* file, construct a quadrilateral and create a tessellation using any of the Transformation tools. Make a sketch of the tessellation.

14. What Transformation tool(s) did you use to create the tessellation?

15. How many angles come together at one vertex of the tessellation?

16. What are the measures of these angles? Find the sum of the measures.

17. Drag a vertex of the original quadrilateral and observe the results. Complete the conjecture:

The sum of the angles that come together at one vertex of a tessellation is _____. Justify your conjecture, using theorems about angles and lines.