

LESSON

- **Lesson: Sum of the Measures of the Angles of a Triangle**

A. Give these instructions:

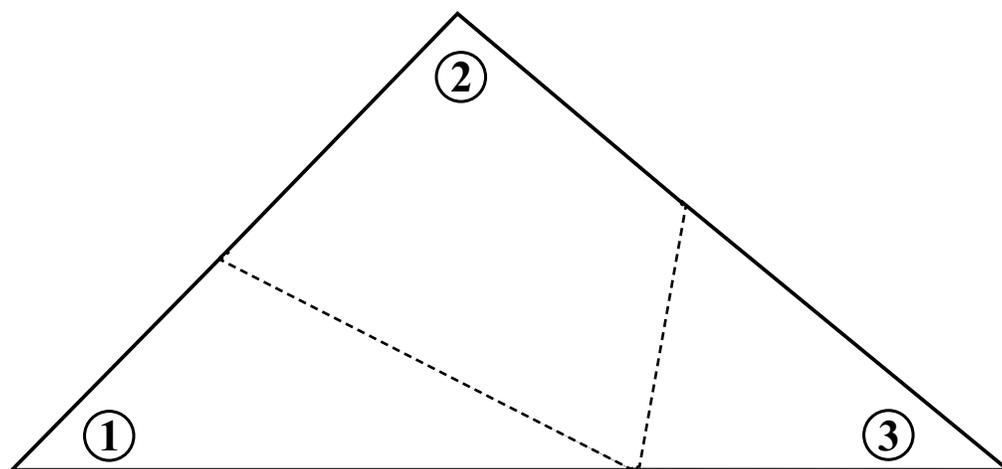
- i. Construct a triangle which covers about half of a sheet of plain paper.
- ii. Measure each angle of your triangle, and find the sum of the measures.

B. Tabulate the sums for the whole class, and notice that, although the triangles drawn by members of the class are very different in size and shape, the sums were all very close to 180° .

Ask students whether they think this is a coincidence, or that this relation is true for all triangles.

C. Next, have each student cut his or her triangle into 3 pieces so that each piece includes one of the angles of the triangle. Label the angles ①, ②, and ③.

Show a transparency of this picture to help the class see what they are to do.

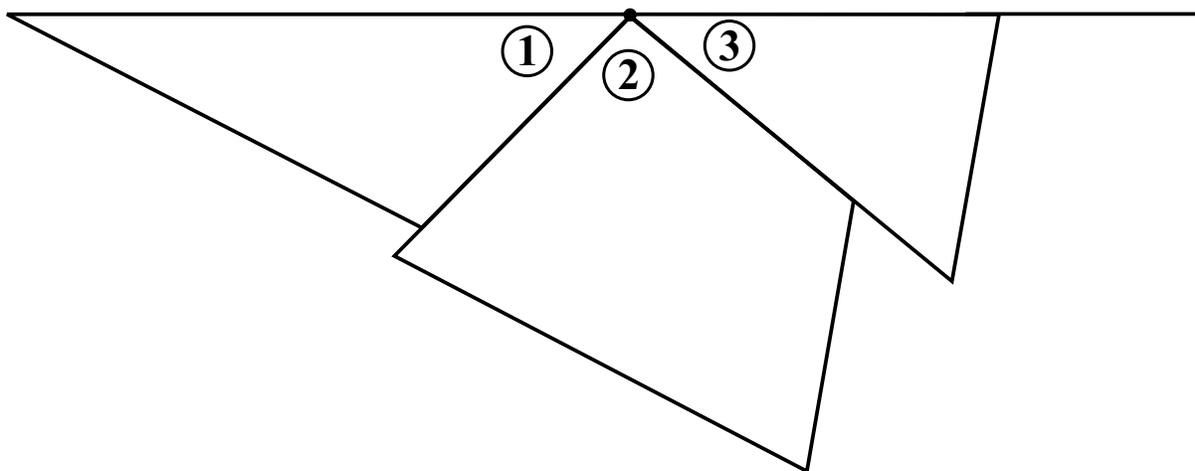


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D. Now instruct students to draw a segment which is about 6 inches long, and put a dot close to the middle of the segment.

Then place the three triangle pieces next to each other along the segment, so that the vertices of the three angles meet at the point designated on the segment.

Show a transparency of the picture below to illustrate all these instructions.



E. Talk about what this activity tells us:

It is strong evidence that the sum of the measures of the angles of any triangle is very close to 180° . (Just as counting the squares was strong evidence that the area of a circle is very close to $3\frac{1}{7}r^2$.)

In fact, the sum of the measures of the angles of any triangle is exactly 180° . (Whereas the area of a circle is not exactly $3\frac{1}{7}r^2$.)

Of course we can't "prove" this by measuring or lining up triangles, because those processes are only approximations. In a later grade, you will have learned enough to understand why this is true for all triangles. Until then, we accept it as true, and will use it to solve problems.