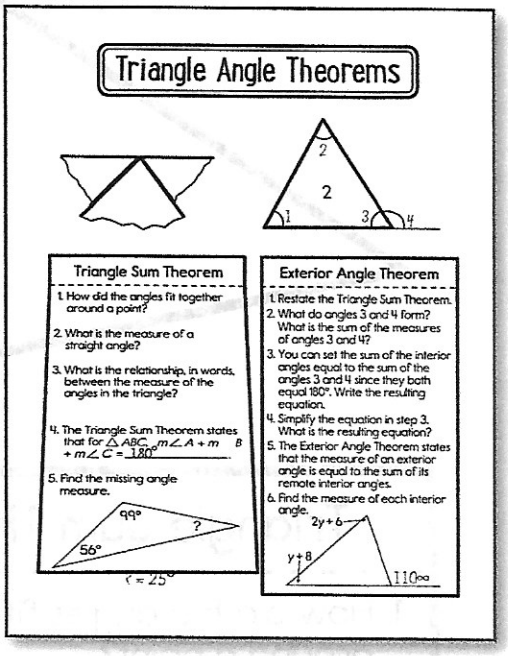
Triangle Angle Theorems

Introduction

Review supplementary angles with students. Have students work in pairs to draw two supplementary angles. Have each set of partners verify their angles with another pair of partners. As a class, draw a set of three supplementary angles.



Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Triangle Angle Theorems pages.
2. Cut out the title and glue it to the top of the page.
3. Cut out triangle 1. Tear off each "corner," making sure that each corner fully includes one angle of the triangle.
4. Draw a point on the page under the title and to the left, leaving some space above it. Glue each piece to the page around the point so that no corners overlap and no gaps are between the pieces.
5. Cut out the *Triangle Sum Theorem* flap. Apply glue to the back of the top section of the flap and attach it below the rearranged triangle on the left.
6. Answer the questions and complete the examples under the flap.
7. Cut out triangle 2. Glue it to the page beside the rearranged triangle. Label the interior angles *1–3*. Extend the base of the triangle and label the exterior angle, opposite angle 3, as angle *4*.
8. Cut out the *Exterior Angle Theorem* flap. Apply glue to the back of the top section and attach it to the right of the *Triangle Sum Theorem* piece.
9. Answer the questions and complete the examples under the flap.

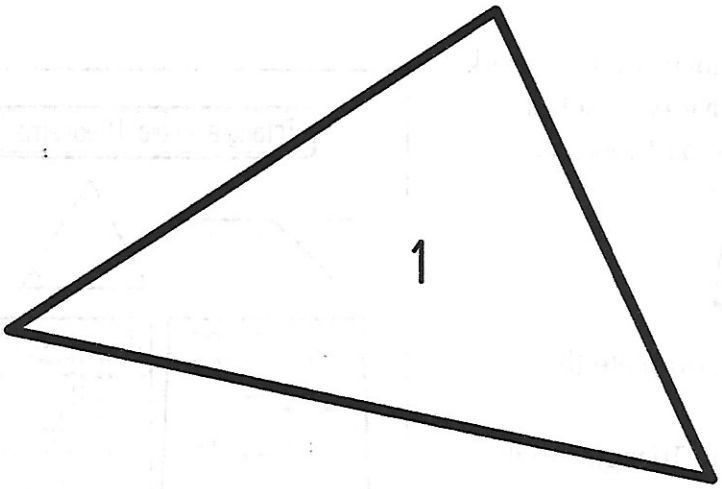
Reflect on Learning

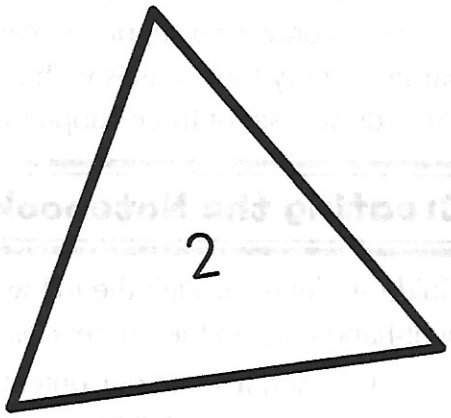
To complete the left-hand page, have students sketch a triangle and draw all of its exterior angles. Then, have students write the number of exterior angles that the triangle has at each vertex. Students should assign angle measures to one of the exterior angles and one of the remote interior angles and use the theorems to calculate the measures of the remaining interior angles.

Answer Key

Triangle Sum Theorem: 1. Angles form a straight line; 2. 180°; 3. the sum of angles from the triangle add up to 180°; 4. 180°; 5. 25°;
Exterior Angle Theorem: 2. straight line, 180°; 3. $m\angle 1 + m\angle 2 + m\angle 3 = + m\angle 3 + m\angle 4$; 4. $m\angle 1 + m\angle 2 = m\angle 4$;
6. $2y + 6 = 70°$, $y + 8 = 40°$

Triangle Angle Theorems





Triangle Sum Theorem

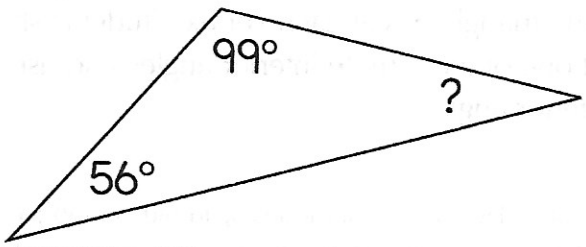
1. How did the angles fit together around a point?

2. What is the measure of a straight angle?

3. What is the relationship, in words, between the measure of the angles in the triangle?

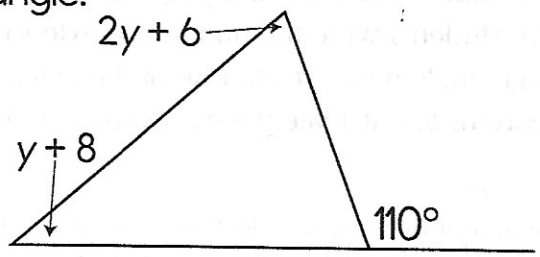
4. The Triangle Sum Theorem states that for $\triangle ABC$, $m\angle A + m\angle B + m\angle C =$ _____.

5. Find the missing angle measure.



Exterior Angle Theorem

1. Restate the Triangle Sum Theorem.
2. What do angles 3 and 4 form? What is the sum of the measures of angles 3 and 4?
3. You can set the sum of the interior angles equal to the sum of the angles 3 and 4 since they both equal 180°. Write the resulting equation.
4. Simplify the equation in step 3. What is the resulting equation?
5. The Exterior Angle Theorem states that the measure of an exterior angle is equal to the sum of its remote interior angles.
6. Find the measure of each interior angle.



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