**It’s a Rip Off**

Opening question: Think-Write Pair-Share

Looking at triangles A-C, what similarities and differences do you notice? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Task 1: Estimation

Use a protractor to measure OR the reference page to estimate all three angles of triangle A-C. List the angle measures below and write them in the interior of the triangles.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Triangle | Angle Measure | Angle Measure | Angle Measure |  |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |

What do you notice about the sum of the interior angles of the triangles?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Task 2: Rip Off the Angles

Rip off the three corners of the triangles and set them so that the angles are *adjacent* (so that the vertices are the same point and one side is shared). Use the line below.

Triangle A

Triangle B

Triangle C

What do you notice about the way the angles of triangles A-C fit when placed together *adjacently*? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many degrees is a straight line? \_\_\_\_\_\_\_\_\_\_\_\_

Seeing how the 3 angles of each triangle fit onto a straight line, what is the sum of the degrees of the interior angles of a triangle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Summary: Triangle Sum Theorem

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the interior angles of any \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is equal to 180 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Word Bank

 degrees sum triangle

Analysis

Do I have enough information to find the missing angle measures below? Why or why not? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Triangle Q

 96°

 42° *x°*

Use the table below to fill in what information we have. Solve for the missing angle.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Triangle | Angle Measure | Angle Measure | Angle Measure | Sum |
| Q |  |  |  |  |

**It's A Rip-Off**

**Teacher Directions**

**Materials:**

* Protractors OR Copies of Angle Measures Page (1 per student)
* Scissors (1 per student)
* Optional: Calculators & Markers or Highlighters

**Directions:**

* Decide if you would like your students to use protractors to measure the angles of the angle reference sheet to *estimate* angle measures.
* Pass out triangles A-C to each student along with scissors for them to cut out the triangles (note: Triangles D-F are optional for those who finish early or if you want more variety).
* Distribute Protractors OR the Angle Measures Page and do the following steps together with Triangle A.
* Use a marker, highlighter or even a pencil to shade in about 1 inch of the interior of each angle of the triangle.
* One at a time, compare the angles to the reference angles OR have students measure with calculators.
* Ask everyone to write estimates of the angle measures in the interior of each angle.
* Have students record their measurements or estimates in the table.
* Rip off the three corners of the triangle and set them so that the angles are adjacent. (That is, so that the vertices are the same point and one side is shared.)
* Estimate the angle formed by all three angles together.
* Compare this to the total of the three earlier estimates. Make changes to the original estimates if necessary.
* Ask participants to repeat what they did to Triangle A with 2-3 other triangles and discuss with their group anything they observe.
* Randomly draw people to share observations.
* Be sure it is observed that for all of these triangles (and indeed all triangles) the three angles together make 180°.



**Conclusion/Formative Assessment**

* Show the following triangle and ask if there is enough information to figure out the measure of the last angle.
* Ask groups to discuss and then randomly draw someone to share their thoughts.



Angle Measures

60°

45°

30°

90°

150°

135°

120°

180°