

Warm Up:

Solve the following system:

$$3(4x - 7y) = 2 \cdot 3$$

$$-4(3x - 3y) = 6 \cdot (-4)$$

$$12x - 21y = 6$$

$$-12x + 12y = -24$$

$$-9y = -18$$

$$y = 2$$

$$4x - 7y = 2$$

$$3x - 3y = 6$$

$$\hline x - 10y = -4$$

$$4x - 7(2) = 2$$

$$4x - 14 = 2$$

$$4x = 16$$

$$x = 4$$

4.1 - Triangle Sum

Triangle Cutting Activity

Triangle Sum Conjecture: The sum of the measures of the angles in every triangle is 180 degrees.

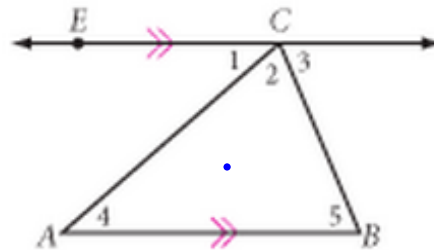


Write a **two-column proof** (a deductive argument that uses statements and reasons) to explain why the *Triangle Sum Conjecture* is true.

Create an **auxiliary line**.

an extra line or segment to help

with a proof



Statements	Reason
$\overline{EC} \parallel \overline{AB}$	lines are both marked as parallel
$\angle 1 \cong \angle 4$	Alternate interior angles
$\angle 3 \cong \angle 5$	Alternate interior angles
Sum of $\angle 1, \angle 2, \angle 3 = 180$	Linear pairs conjecture

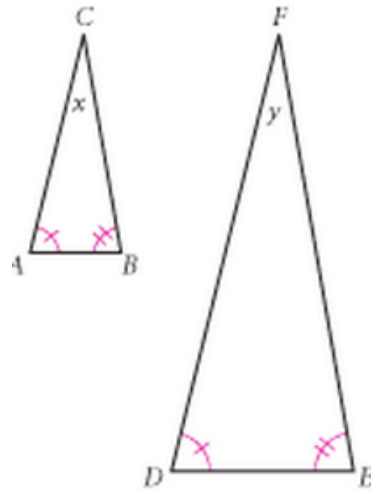
Investigation:

Draw a triangle on your notebook paper. Create a second triangle on patty paper by tracing two of the angles of your original triangle, but make the side between your new angles longer than the corresponding side in the original triangle. How do the third angles in the two triangles compare?

Third Angle Conjecture: If two angles of one triangle are equal in measure to two angles of another triangle, then the third angles of the triangles are equal in measure.



Use the Triangle Sum Conjecture and the figures at right to write a two-column proof explaining why the Third Angle Conjecture is true.



Statement	Reason
$\angle A \cong \angle D$	because markings are congruent
$\angle B \cong \angle E$	because markings are congruent
$\angle x \cong \angle y$	because triangle Sum Conjecture

