

# Mr. Baroody's Web Page

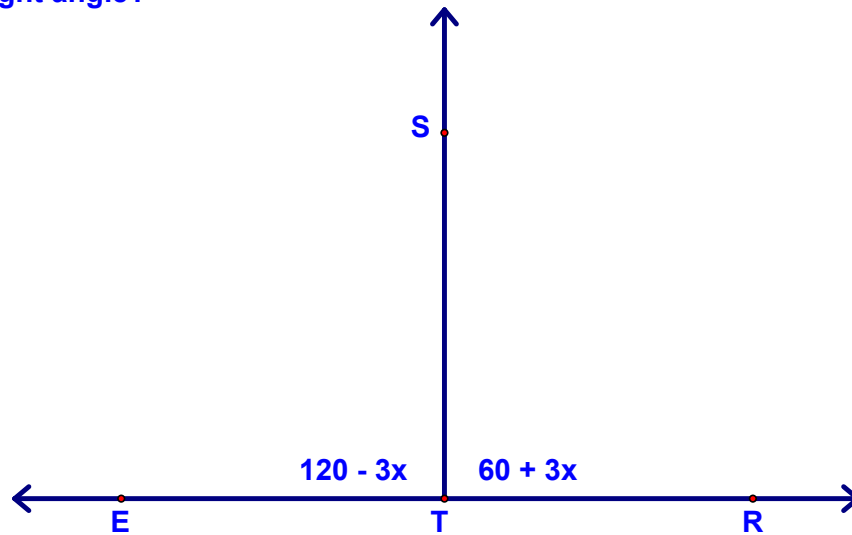


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## Beginning Proofs - Lesson 1-4

Here's the warmup:

Is  $\angle STR$  a right angle?



Let's define what a theorem is:

**A theorem is a mathematical statement that can be proved.**

**We present theorems and then *prove* them using a logical argument.**

**Once proved, a theorem can be used to help prove other theorems or problems.**

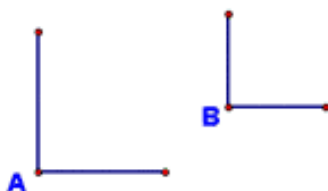
Now we're going to talk about our first theorem and prove it using a two-column proof. Note that the theorem is straight forward, as should be the proof. Remember that we can only use previously proved theorems and definitions...that's why all the steps here. However, now that we've proved this theorem, we can use it to prove other theorems! Also - start to get comfortable with this style of proof - we'll be using it extensively throughout the year!! Woohoo!!

One item of note: See how the hypothesis of our last reason below is drawn from previously justified statements and how the conclusion is the same as the statement it is justifying. This is a very common pattern you'll see all year...get used to it and learn to use it!!

**Theorem 1 - If two angles are right angles, then they are congruent.**

**Given:**  $\angle A$  is a right  $\angle$   
 $\angle B$  is a right  $\angle$

**Prove:**  $\angle A \cong \angle B$



Statements	Reasons
1. $\angle A$ is a right angle	1. Given
2. $m\angle A = 90^\circ$	2. If an angle is a right angle, then its measure is $90^\circ$ .
3. $\angle B$ is a right angle	3. Given
4. $m\angle B = 90^\circ$	4. Same as 2.
5. $\angle A \cong \angle B$	5. If two angles have the same measure, then they are congruent.

Now let's prove Theorem 2...it should look very similar to the previous one!

**Theorem 2 - If two angles are straight angles, then they are congruent.**

**Given:**  $\angle ABC$  is a straight  $\angle$   
 $\angle DEF$  is a straight  $\angle$



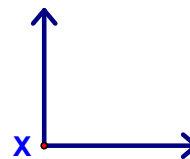
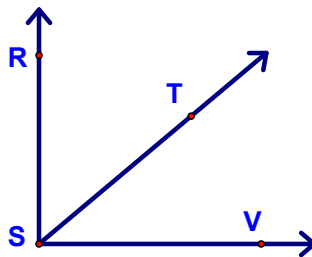
**Prove:**  $\angle ABC \cong \angle DEF$



Statements	Reasons

Lastly, we'll use the first of these theorems in another proof. Note that things like addition are "all good" to use as the reason in a proof.

**Given:**  $m\angle RST = 50^\circ$   
 $m\angle TSV = 40^\circ$   
 $\angle X$  is a right  $\angle$



**Prove:**  $\angle RSV \cong \angle X$

Statements	Reasons