

Worksheets for section 4.4 on the Isosceles Triangle Theorem (triangles on last page)

In this activity, you will make a conjecture and prove a theorem about isosceles triangles.

On a separate piece of paper you have isosceles triangle ABC , with congruent sides \overline{AC} and \overline{BC} . The congruent sides are marked.

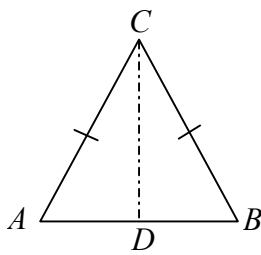
Fold the triangle, bisecting $\angle C$. What do you notice about the angles opposite the congruent sides?

Conjecture: In an isosceles triangle, the angles opposite the congruent sides are _____

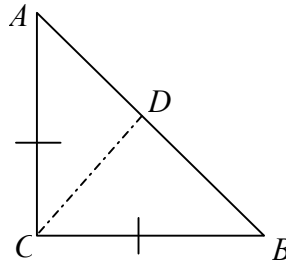
Let's see if we can prove this conjecture using what we know about congruent triangles.

On the triangle you folded, mark the intersection of the angle bisector and \overline{AB} as point D .

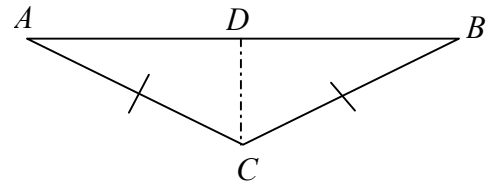
Your triangle should look something like this.



OR



OR



\overline{CD} creates two triangles from $\triangle ABC$. Name the triangles. _____ and _____

Since this triangle is isosceles, which two sides are given to be congruent? _____ and _____

Since \overline{CD} bisects angle C , which two angles are congruent? _____ and _____.

What is the side common to the two triangles? _____. Remember that we say that a common side is congruent to itself by Which property? _____. We say that _____ \cong _____.

Which of the triangle congruence postulates can be used to state $\triangle ADC \cong \triangle BDC$?

Since the triangles are congruent, we know that their _____ parts are congruent. Therefore _____ \cong _____, which is what we wanted to prove.

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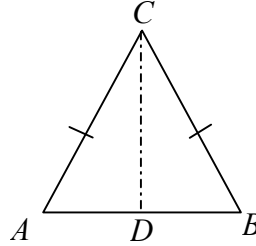
On the back of this paper, write a formal proof of the Isosceles Triangle Theorem.

In an isosceles triangle, the angles opposite the congruent sides are congruent.

Given: Isosceles $\triangle ABC$, $\overline{AC} \cong \overline{BC}$.

\overline{CD} bisects $\angle ACB$.

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



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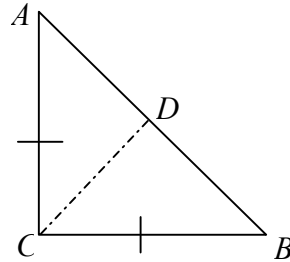
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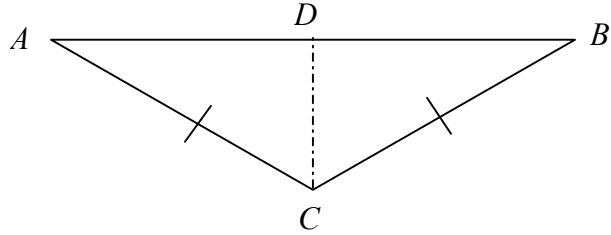
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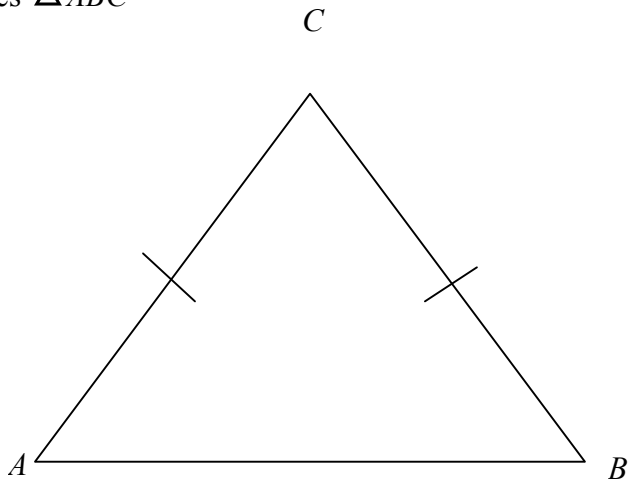
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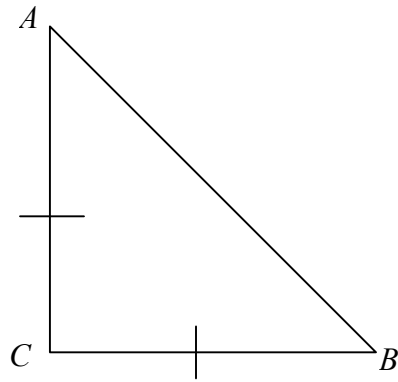


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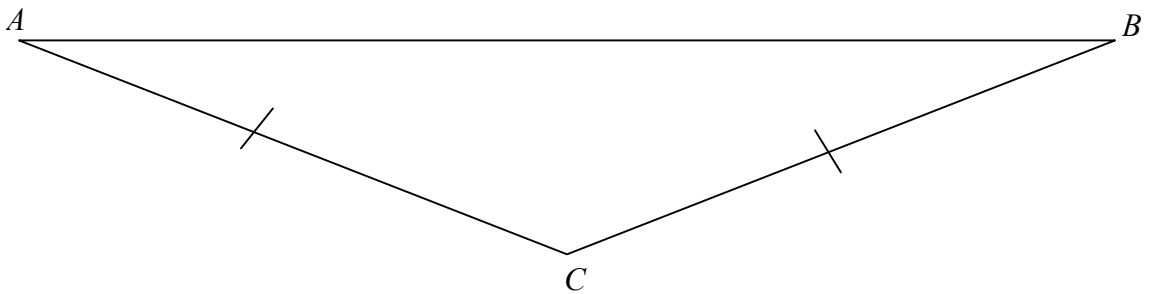
Acute isosceles $\triangle ABC$



Right isosceles $\triangle ABC$



Obtuse isosceles $\triangle ABC$



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