Theorem 20: If two sides of a triangle are congruent, the angles opposite the sides are congruent. (If A, then A.)

















Theorem 21: If two angles of a triangle are congruent, the sides opposite the angles are congruent. (If \triangle , then \triangle .)





The two theorems tell us:

If at least two sides of a triangle are congruent, the triangle is isosceles.

If at least two angles of a triangle are congruent, the triangle is isosceles. Theorem 20: If two sides of a triangle are congruent, the angles opposite the sides are congruent. (If Δ , then Δ .)

The inverse of Theorem 20 is true: If two sides of a triangle are not congruent, then the angles opposite them are not congruent, and the larger angle is opposite the longer side. (If \triangle , then \triangle .) Theorem 21: If two angles of a triangle are congruent, the sides opposite the angles are congruent. (If \triangle , then \triangle .)

The inverse of Theorem 21 is true: If two angles of a triangle are not congruent, then the sides opposite them are not congruent, and the longer side is opposite the larger angle. (If \triangle , then \cancel{A} .)



The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	B C
Statement	Reason
	I

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	B D C
Statement	Reason
	1





The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	BC
Statement	Reason
1. Isosceles △ABC with vertex ∠A	1. Given

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: $\angle BAD \cong \angle CAD$ <i>Proof</i> Statement	B ^L LLA Reason
1. Isosceles △ABC with vertex ∠A (S) 2. $\overline{AB} \cong \overline{AC}$	1. Given 2. Legs of isos. \triangle are \cong .

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: $\angle BAD \cong \angle CAD$ <i>Proof</i>	B
Statement 1. Isosceles $\triangle ABC$ with vertex $\angle A$ (S) 2. $\overline{AB} \cong \overline{AC}$ (A) 3. $\angle B \cong \angle C$	Reason 1. Given 2. Legs of isos. Δ are \cong . 3. If Δ , then Δ .

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	BC
Statement	Reason
1. Isosceles $\triangle ABC$ with vertex $\angle A$ 2. $\overline{AB} \cong \overline{AC}$ (A) 3. $\angle B \cong \angle C$ 4. \overline{AD} is a median	 Given Legs of isos. △ are ≃. If △, then △. Given

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	BC
Statement	Reason
1. Isosceles $\triangle ABC$ with vertex $\angle A$ 2. $\overline{AB} \cong \overline{AC}$ 3. $\angle B \cong \angle C$ 4. \overline{AD} is a median 5. D is mdpnt. of \overline{AD}	 Given Legs of isos. △ are ≅. If △, then△. Given Def. of median

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: $\angle BAD \cong \angle CAD$ <i>Proof</i>	BCLAC
Statement	Reason
1. Isosceles $\triangle ABC$ with vertex $\angle A$ 3. $\angle B \cong \overline{AC}$ 4. \overline{AD} is a median 5. \overline{D} is mdpnt. of \overline{AD} 5. $\overline{BD} \cong \overline{CD}$	 Given Legs of isos. △ are ≅. If △, then△. Given Def. of median Def. of midpoint

The median to the base of an is vertex angle.	sosceles triangle bisects the
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: $\angle BAD \cong \angle CAD$ <i>Proof</i>	BCLAC
Statement	Reason
1. Isosceles $\triangle ABC$	1. Given
(S) 2. $\overrightarrow{AB} \cong \overrightarrow{AC}$	2. Legs of isos. \triangle are \cong .
(Å) 3. <u>∠</u> B≅∠C	3. If Δ , then Δ .
4. \overrightarrow{AD} is a median	4. Given
5. D is mapped to a D is a D	5. Def. of median 6. Def. of midnoint
$7. \triangle ABD \cong \triangle ACD$	7. SAS

vertex angle.	^
Given: Isosceles △ABC with vertex ∠A and median AD	
Prove: \angle BAD $\cong \angle$ CAD <i>Proof</i>	BC
Statement	Reason
1. Isosceles $\triangle ABC$	1. Given
S 2. $\overrightarrow{AB} \cong \overrightarrow{AC}$ A 3. $\angle B \cong \angle C$ 4. \overrightarrow{AD} is a median 5. \overrightarrow{D} is mdpnt. of \overrightarrow{AD} S 6. $\overrightarrow{BD} \cong \overrightarrow{CD}$ 7. $\triangle ABD \cong \triangle ACD$ 8. $\angle BAD \cong \angle CAD$	 Legs of isos. △ are ≅. If △, then△. Given Def. of median Def. of midpoint SAS CPCTC

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