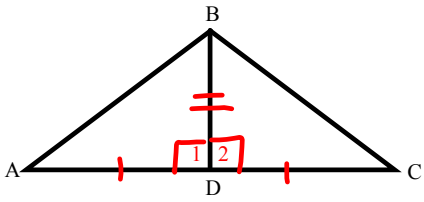
HW #4 - Due Fri, Dec 4
Ch 4 Review Problems pp.176-180 #7-36, 48,51,52

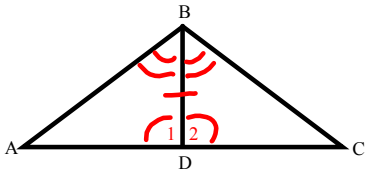
Khan Academy exercises: "Congruence"

4.4 - Congruence Proofs



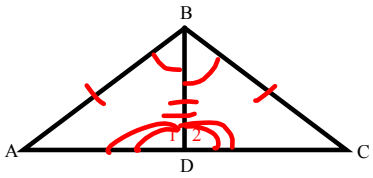
Given: D is the midpoint of AC
BD ⊥ AC
is perpendicular to

2. Why is AD=DC? midpoint D divides AC into two equal parts
3. Why are ∠1 and ∠2 right angles? perpendicular lines form right angles
4. Why is ∠1= ∠2? all right angles are equal
5. Why is BD=BD? reflexive property of equality
6. Why is ΔABD≅ΔCBD? SAS congruence
7. Why is ∠BAD=∠BCD? corresponding parts of congruent triangles are equal



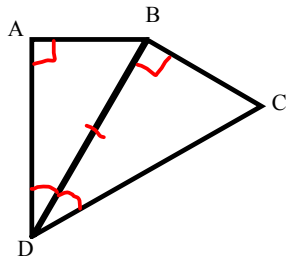
Given: ∠1= ∠2
∠ABD=∠CBD

9. Why is BD=BD?
reflexive property of equality
10. Why is ΔABD≅ΔCBD?
ASA congruence
11. Why is BA=BC?
corresponding parts of congruent triangles are equal



Given: BA=BC
BD bisects ∠ABC

13. Why is ∠ABD=∠CBD? Bisector BD divides angle ABC into two equal parts
14. Why is BD=BD?
reflexive property of equality
15. Why is ΔABD≅ΔCBD?
SAS congruence
16. Why is ∠1= ∠2?
corresponding parts of congruent triangles are equal
17. If ∠1 and ∠2 are a linear pair, why is BD ⊥ AC?
equal angles in a linear pair mean perpendicular lines (have perpendicular sides)

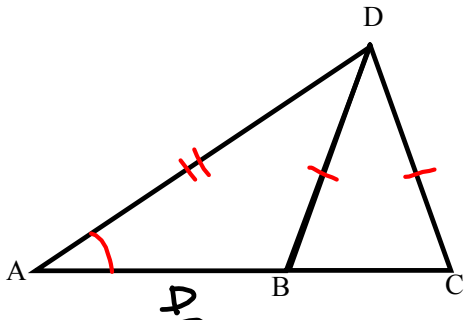


What is *wrong* with this proof?

Given: DB bisects ∠ADC
∠A and ∠DBC are right angles.
Prove: ΔADB≅ΔBDC

Proof:

Statements	Reasons
1. DB bisects ∠ADC	Given.
2. ∠ADB=∠BDC	If an angle is bisected, it is divided into two equal angles.
3. BD=BD	Reflexive.
4. ∠A and ∠DBC are right angles	Given
5. ∠A=∠DBC	All right angles are equal.
6. ΔADB≅ΔBDC	ASA

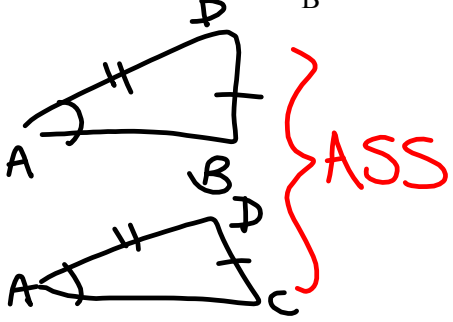


What is *wrong* with this proof?

Given: DB=DC
Prove: AB=AC

Proof:

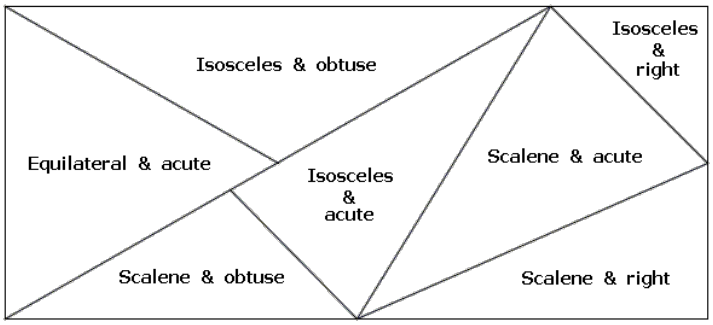
Statements	Reasons
1. DB=DC	Given
2. AD=AD	Reflexive
3. ∠DAB=∠DAC	Reflexive
4. ΔDAB≅ΔDAC	SAS
5. AB=AC	Corresponding parts of congruent triangles are congruent



4.5 – Isosceles and Equilateral Triangles

Definitions: A triangle is

- scalene iff it has no equal sides
- isosceles iff it has at least two equal sides
- equilateral iff all of its sides are equal
- obtuse iff it has an obtuse angle
- right iff it has a right angle
- acute iff all of its angles are acute
- equiangular iff all of its angles are equal



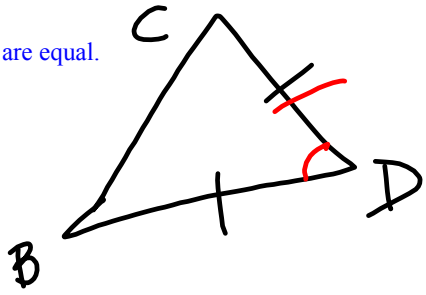
Theorem 9: If two sides of a triangle are equal, the angles opposite them are equal.

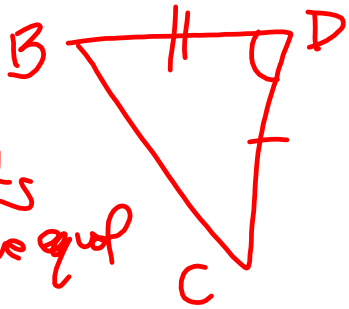
Given: In ΔBCD, BD=CD

Prove: ∠C=∠B

Proof:

Statements	Reasons
1. In ΔBCD, BD=CD	Given
2. ∠D=∠D	reflexive property
3. CD=BD	Given
4. ΔBCD≅ΔCBD	SAS congruence
5. ∠C=∠B	corresponding parts of congruent △'s are equal



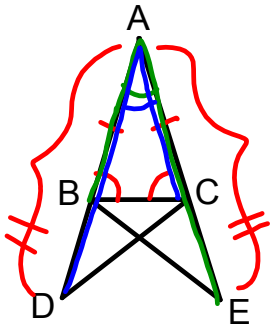


Theorem 10: If two angles of a triangle are equal, the sides opposite them are equal.

Corollaries to Theorems 9 and 10:

An equilateral triangle is equiangular.

An equiangular triangle is equilateral.



In ΔABC, AB=AC; AD=AE.

7. What kind of triangle is ΔABC?

isosceles

8. Why is ∠ABC=∠ACB?

if 2 sides of a Δ are equal, then the angles opposite them are equal

9. What angle do ΔACD and ΔABE have in common?

∠A = ∠A (∠DAC = ∠BAE)

10. Why is ΔACD≅ΔABE?

SAS congruence

11. Why is ∠D=∠E?

corresponding parts of congruent Δ's are equal