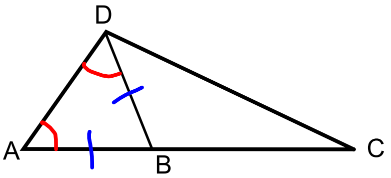
48.

Given: A-B-C; ∠ADB=∠DAB
Prove: AC>DB



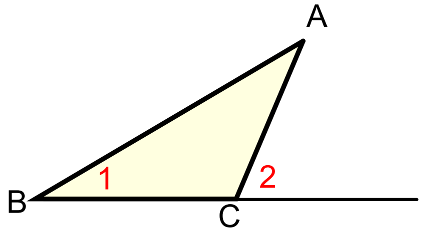
Proof:

Statements:	**Reasons:**
1. A-B-C; ∠ADB=∠DAB	Given
2. AB+BC=AC	Betweenness of Points Theorem
3. AB=DB	If two angles in a Δ are =, the sides opposite them are equal
4. DB+BC=AC	substitution
5. either A<B<C or A>B>C	A-B-C (Betweenness of Points Definition)
6. B≠C	either B<C or B>C so B≠C
7. BC>0	Ruler postulate
8. DB+BC>DB	Addition
9. AC>DB	Substitution

5.2 – The Exterior Angle Theorem

Def: An exterior angle of a triangle is an angle that forms a linear pair with an angle of the triangle.

In ΔABC, exterior ∠2 forms a linear pair with ∠ACB.
The other two angles of the triangle, ∠1 (∠B) and ∠A are called remote interior angles with respect to ∠2.

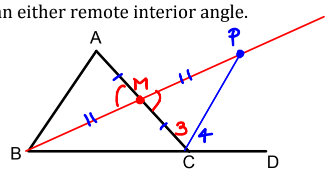


Theorem 12: The Exterior Angle Theorem

An Exterior angle of a triangle is greater than either remote interior angle.

Given: ∠ACD is an exterior angle of ΔABC.

Prove: ∠ACD>∠A and ∠ACD>∠B



Proof:

Statements	**Reasons**
1. ∠ACD is an exterior angle of ΔABC	Given
2. Let M be the midpoint of AC	segment bisector is unique (by compass construction)
3. AM=MC	segment bisector divides a line segment into two equal segments
4. Draw line BM	two points define a line
5. Choose P on line BM so that MB=MP	compass construction to copy line segment
6. Draw CP	2 points define a line
7. ∠AMB=∠CMP	Vertical ∠'s are equal
8. ΔAMB≅ΔCMP	SAS congruence
9. ∠A=∠3	corresponding parts of congruent △'s are equal
10. ∠ACD=∠3+∠4	Betweenness of Rays Theorem
11. ∠ACD>∠3	Whole greater than part
12. ∠ACD>∠A	Substitution

HW #1 (submitted Friday, 11/7)

- Read Ch 1 & Ch 2
- Ch 1 Review Problems pp. 36-38
- Start working on Geometry badge on Khan Academy

HW #2 (submitted Friday, 11/14)

- Read Ch 3 & Ch 4
- Ch 2 Review Problems pp. 71-74
- Ch 3 Review Problems pp. 124-128
- Khan Academy exercises:
  "Introduction to Euclidean geometry"
  "Angles and intersecting lines"

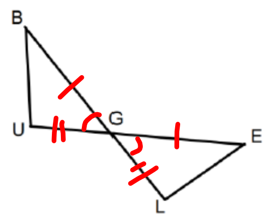
HW #3 (due Friday, 11/21)

- Read Ch 4 & Ch 5
- **Ch 4 Review Problems pp.176-180**
- Khan Academy exercises: "Congruence"

1. J	14. F
2. W	15. R
3. P	16. D
4. G	17. N
5. L	18. X
6. E	19. M
7. S	20. Z
8. H	21. T
9. Q	22. B
10. A	23. I
11. Y	24. K
12. O	25. U
13. V	26. C

Given: ∠BGU and ∠EGL are vertical angles;
BG=GE;
UG=GL.

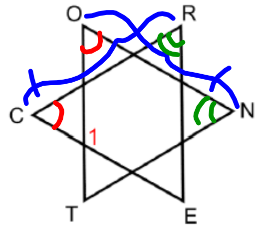
***Prove*: BU=LE**



Statements:	Reasons:
27. BG=GE, UG=GL	Given
28. ∠BGU & ∠EGL are vertical ∠s	Given
29. ∠BGU=∠EGL	vertical angles are equal
30. ΔUGB ≅ ΔLGE	SAS Congruence
31. BU=EL	Corresponding parts of congruent Δ's are equal

Given: $\angle C = \angle O$;
$\angle R$ and $\angle N$ are supplements of $\angle 1$;
$CR = ON$.

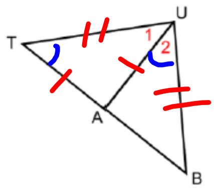
Prove: $\Delta CRE \cong \Delta ONT$.



Statements:	Reasons:
32. $\angle C = \angle O$; $CR = ON$	Given
33. $\angle R$ & $\angle N$ are supplements of $\angle 1$	Given
34. $\angle R + \angle 1 =$ $180°$	Supplementary angles sum to 180°
35. $\angle N +$ $\angle 1$ $= 180°$	Supplementary angles sum to 180°
36. $\angle R + \angle 1 = \angle N + \angle 1$	Substitution
37. $\angle R = \angle N$	Subtraction
38. $\Delta CRE \cong \Delta ONT$	ASA congruence

Given: $\angle T$ and $\angle 2$ are complements of $\angle 1$;
$TA = AU$;
$TU = UB$.

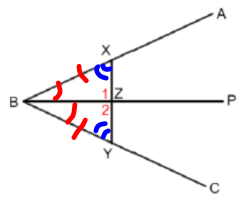
Prove: $AU = AB$.



Statements:	Reasons:
39. $TA = AU$; $TU = UB$	Given
40. $\angle T$ & $\angle 2$ are complements of $\angle 1$	Given
41. $\angle T +$ $\angle 1$ $= 90°$	Complementary angles sum to 90°
42. $\angle 2 + \angle 1 =$ $90°$	Complementary angles sum to 90°
43. $\angle T + \angle 1 = \angle 2 + \angle 1$	Substitution
44. $\angle T = \angle 2$	Subtraction
45. $\Delta ATU \cong \Delta AUB$	SAS congruence
46. $AU = AB$	Corresponding parts of congruent triangles are equal.

Given: BP bisects ∠ABC;
BX=BY;
∠1 and ∠2 form a linear pair.

***Prove*: XY ⊥ BP.**



Statements:	Reasons:
47. BX=BY	Given
48. ∠BXY = ∠BYX	If two sides of a triangle are equal, the ~~sides~~ angles opposite them are equal.
49. BP bisects ∠ABC	Given
50. ∠CBP=∠ABP	angle bisectors divide an angle into 2 equal angles
51. △BXZ ≅ △BYZ	ASA congruence
52. ∠1= ∠2	corresponding parts of congruent △'s are =
53. ∠1 and ∠2 form a linear pair	Given
54. XY ⊥ BP	Two equal angles forming a linear pair have perpendicular sides