ICG - 1

Postulate 7.1 A whole is greater than any of its parts.

Ex

$AC > AB$

$AC > BC$

Postulate 7.2 If a, b, and c are real numbers such that $a > b$ and $b > c$, then $a > c$.

Postulate 7.3 A quantity may be substituted for its equal in any statement of inequality.

Ex If $AB > CD$ and $CD = EF$

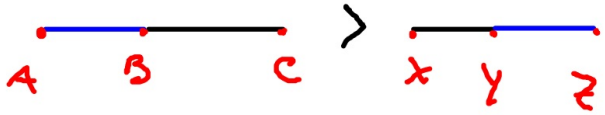
then $AB > EF$

Postulate 7.4 Given any two quantities, a and b, one and only one of the following is true:
$a < b$ or $a = b$ or $a > b$.

Ex $AB > AB$ ← no reflexive property

$AB > BC$ $\quad BC > AB$ ← no symmetric property

Postulate 7.5 If equal quantities are added to unequal quantities, then the sums are unequal in the same order.



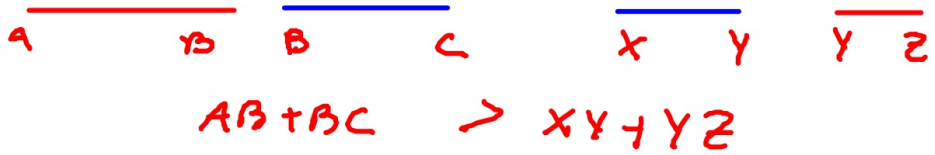
$AB = YZ$

$BC > XY$

$AB + BC > XY + YZ$

Postulate 7.6 If unequal quantities are added to unequal quantities in the same order, then the sums are unequal in the same order.

AB > YZ
BC > XY



AB + BC > XY + YZ

Postulate 7.7 If equal quantities are subtracted from unequal quantities, then the differences are unequal in the same order.

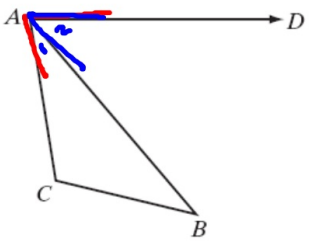
AB = XY

AC > XZ

AC - AB > XZ - XY

Given: $m\angle DAC = m\angle DAB + m\angle BAC$ and $m\angle DAB > m\angle ABC$

Prove: $m\angle DAC > m\angle ABC$



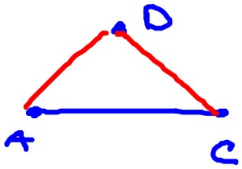
Proof

Statements	Reasons
1. $m\angle DAC = m\angle DAB + m\angle BAC$	1. Given
2. $m\angle DAC > m\angle DAB$	2. A whole is greater than any of its parts.
3. $m\angle DAB > m\angle ABC$	3. Given
4. $m\angle DAC > m\angle ABC$	4. Transitive property of inequality

In 3–12: **a.** Draw a diagram to illustrate the hypothesis and tell whether each conclusion is true or false. **b.** State a postulate or a definition that justifies your answer.

4. If D is not on $\overline{AC}$, then $CD + DA < CA$.

a)



b) the shortest distance between two points is a straight line.

In 3–10, in each case use an inequality postulate to prove the conclusion.

4. If $4 < 14$, then $15 < 25$.

$4 < 14$

$4+11 < 14+11$

$15 < 25$