Properties of Inequality

If $a > b$ and $c \geq d$, then $a + c > b + d$.

If $a > b$ and $c > 0$, then $ac > bc$ and $\frac{a}{c} > \frac{b}{c}$.

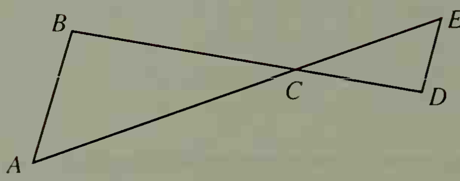
If $a > b$ and $c < 0$, then $ac < bc$ and $\frac{a}{c} < \frac{b}{c}$.

If $a > b$ and $b > c$, then $a > c$.
If $a = b + c$ and $c > 0$, then $a > b$.

Example 2

Given: $AC > BC$; $CE > CD$

Prove: $AE > BD$



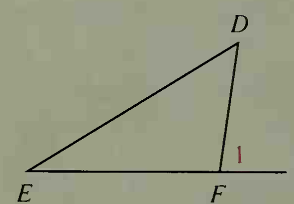
Proof:

Statements	Reasons
1. $AC > BC$; $CE > CD$	1. Given
2. $AC + CE > BC + CD$	2. A Prop. of Ineq.
3. $AC + CE = AE$; $BC + CD = BD$	3. Segment Addition Postulate
4. $AE > BD$	4. Substitution Prop.

Example 3

Given: $\angle 1$ is an exterior angle of $\triangle DEF$.

Prove: $m\angle 1 > m\angle D$;
$m\angle 1 > m\angle E$



Proof:

Statements	Reasons
1. $m\angle 1 = m\angle D + m\angle E$	1. The measure of an ext. $\angle$ of a $\triangle$ equals the sum of the measures of the two remote int. $\angle$s.
2. $m\angle 1 > m\angle D$; $m\angle 1 > m\angle E$	2. A Prop. of Ineq.

Example 3 above proves the following theorem.

Theorem 6-1 *The Exterior Angle Inequality Theorem*

The measure of an exterior angle of a triangle is greater than the measure of either remote interior angle.