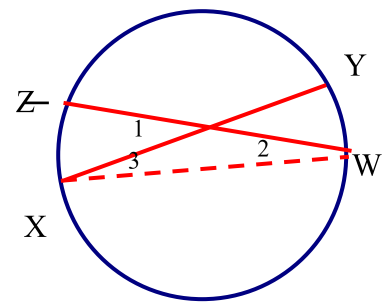
Theorem **When 2 secants intersect in a circle, the $\angle$ formed is $=$ to $\frac{1}{2}$ the sum of the arcs formed by the vertical $\angle$.**

Given: XY & ZW intersect

Prove: $\angle 1 = \frac{1}{2}(\overset{\frown}{XZ} + \overset{\frown}{YW})$



Statements	Reasons
1. Draw $\overline{XW}$	Construction
2. $\angle 1 = \angle 2 + \angle 3$	Ext $\angle$ of Δ = sum of 2 remote int $\angle$'s
3. $\angle 2 = \frac{1}{2}\overset{\frown}{ZX}$ $\angle 3 = \frac{1}{2}\overset{\frown}{YW}$	Inscribed $\angle = \frac{1}{2}$ intercepted arc
4. $\angle 1 = \frac{1}{2}\overset{\frown}{ZX} + \frac{1}{2}\overset{\frown}{YW}$	Substitution in step 2
5. $\angle 1 = \frac{1}{2}(\overset{\frown}{ZX} + \overset{\frown}{YW})$	Distributive Prop

Notice the importance of the triangle theorems in these proofs.