1. Suppose $\mathcal{C}$ is a circle and that L_1 is a secant line that intersects the circle at A and B. Let L_2 be the tangent line to the circle at A. Show that the angles between L_1 and L_2 at A are each equal to 1/2 of the measure of the corresponding arc determined by the chord AB on the circle (there are two such arcs whose sum of measures is $360°$).

2. Suppose $\mathcal{C}$ is a circle, that L_1 and L_2 are two lines secants to the circle and assume that $L_1 \cap L_2 = \{P\}$ where P is a point in the interior of the circle. Find and prove formulae for the angles at P between L_1 and L_2 in terms of the arcs determined on the circle by the 4 points of intersection with the two secants.

3. Suppose $\mathcal{C}$ is a circle and assume that A and B are points on the circle. Denote by L_1 and L_2 the tangent lines to the circle at A, respectively B. Find and prove a formula for the (acute) angle between L_1 and L_2 in terms of the arcs determined by the points A and B on the circle.