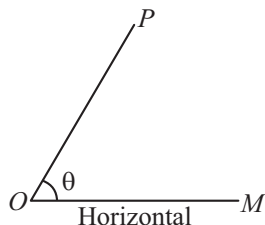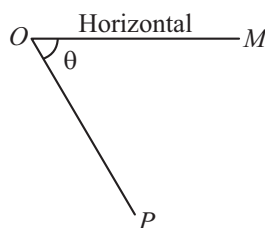# Heights and Distances

Angle of Elevation
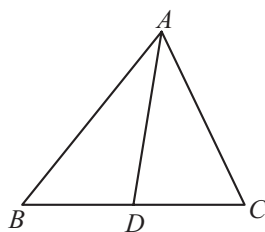

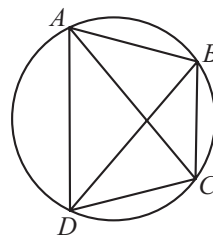## Angle of Depression

Apollonius Theorem

$AB^2 + AC^2 = 2(AD^2 + BD^2)$ or $2(AD^2 + DC^2)$

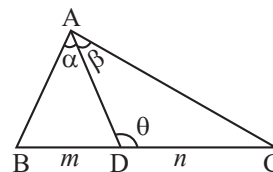

Ptolemy's Theorem

$AC.BD = AB.CD + AD.BC$

m-n Theorem

(i) $(m + n) \cot \theta = m \cot \alpha - n \cot \beta$

(ii) $(m + n) \cot \theta = n \cot B - m \cot C$

Properties of Circles

❖ If AB subtends equal angles at two points P and Q, the points A, B, P and Q are concyclic. ($\because$ Angles on the same segment of a circle are equal)

❖ Angle subtended by a chord at the center is twice the angle subtended at any point on the circumference.

❖ Let AP be the tangent at a point A on the circumference of a circle passing through A, B and C. Then $\angle BAP = \angle ACB$.