**Development stage 1:**

1. Alina and Vinsie are observing the Moon in two different cities at the same time. Alina is in New York and Vinsie is in London, assuming they are at the same level ground 3500 miles apart. If the distance measured along the line of sight of Vinsie to the moon is 240000 miles with the angle of elevation of 70 º,

   (a) Find the distance measured along the line of sight of Vinsie to the Moon. (2dps)

   (b) Hence, find the angle of elevation of Alina to the Moon, to the nearest minutes.

   (c) Hence, find the vertical angle of the Moon for both girls.

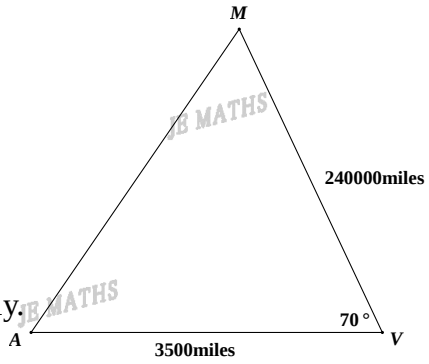
**Development stage 1:**

1. (a)

$x^2 = 3500^2 + 240000^2 - 2 \times 3500 \times 240000 \cos 70^\circ$

$x = 238825.5769$

$= 238825.58$ miles




(b) $\cos A = (238825.58^2 + 3500^2 - 240000^2)/2 \times 238825.58 \times 3500$

$= 109^\circ 21' 39.19''$

$= 109^\circ 22'$ (nearest minutes)

**Notice:** when three sides of the triangle is fixed, use cosine rule only.

(c) $\angle M = 180^\circ - 70^\circ - 109^\circ 22'$

$= 0^\circ 38'$