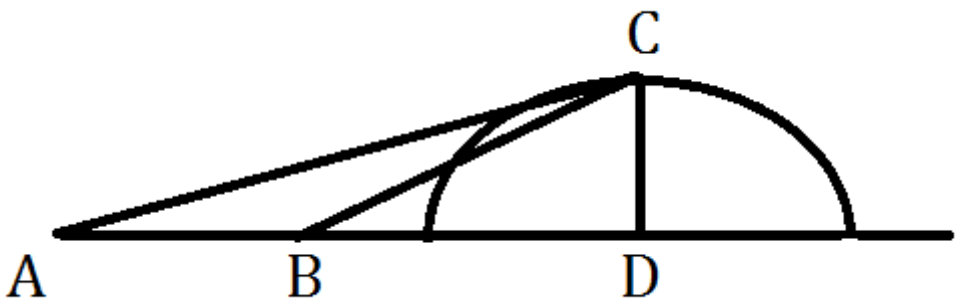
Answer on Question #81010 – Math – Trigonometry

Question

Two points, A and B, are 526 apart on a level stretch of road leading to a hill. The angle of elevation of the hilltop from A is 26°30', and the angle of elevation from B is 36°40'. How high is the hill

Solution



1. Points A and B are the data points in the conditions. Point C is the top of the hill. Point D is the projection of the top of the hill on the line AB
2. $\angle CAD = 26°30' = 26.5°; \angle CBD = 36°40' = 36.6667°;$
3. $If\ CD = x\ and\ BD = y\ then$

$$tan\angle CAD = \frac{x}{y+526}; then\ x = tan\angle CAD * y + tan\angle CAD * 526$$

$$tan\angle CBD = \frac{x}{y}; then\ x = tan\angle CBD * y$$

$$Since\ x = x\ then\ tan\angle CAD * y + tan\angle CAD * 526 = tan\angle CBD * y;$$

$$tan\angle CAD = tan26.5° = 0.50 \text{ and } tanCBD = tan36.6667 = 0.74 \text{ then}$$

$$0.5 * y + 0.5 * 526 = 0.74 * y;$$

$$0.24 * y = 263;$$

$$y = 1095.83;$$

4. Since $tan\angle CBD = \frac{x}{y}\ then\ x = tan\angle CBD * y;$

$$x = 0.74 * 1095.83 = 821.875$$

Answer: The height of the hill is equal to 824.875.