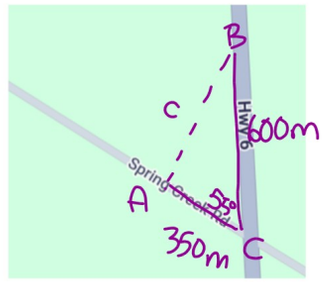
Problem Solving - Cosine

Example 1: Two students get off the bus at the corner of Highway 6 and Spring Creek Road. One student walks 600m north along Highway 6. The other walks 350m north-west along Spring Creek Road. If the angle between the roads is 55°, how far apart the students?



$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 600^2 + 350^2 - 2(600)(350)\cos 55°$

$\cdots$

$c^2 = 241597.90$

$c = \sqrt{\cdots}$

$c \doteq 491.5$

∴ The students are 491.5m apart.

Example 2: The base of an A-frame cottage is 18ft wide. The roof slants are $26\frac{1}{4}$ ft long. What is the angle of elevation of the roof?

$\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

$\cos A = \dfrac{26.25^2 + 18^2 - 26.25^2}{2(26.25)(18)}$

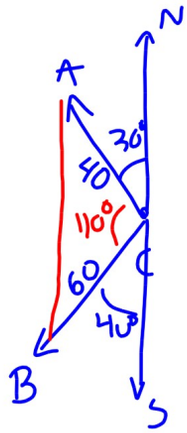
$\cos A = \dfrac{324}{945}$

$A = \cos^{-1}(0.3429)$

$A = 70°$

∴ The angle of elevation is 70°.

8



pg 21 # 5 - 12

pg. 21 #5 - 10