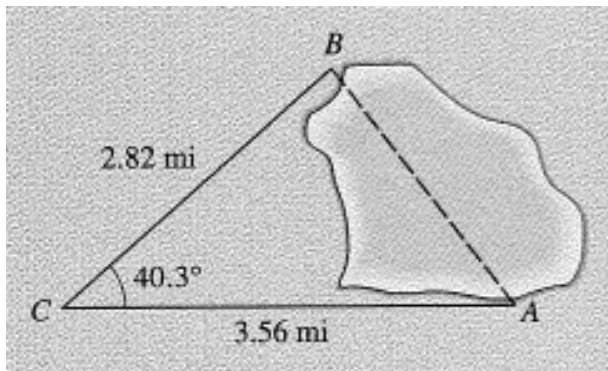**Term Test B version 1**

(1) [5 points] Solve the following equation for r.

$$\frac{2}{r} - \frac{7}{r+5} = \frac{70}{r^2 - 25}$$

(2) [6 points] To find the distance across a small lake, a surveyor has taken the measurements shown. Find the distance across the lake using this information.

(3) [6 points] Solve the following equation for angles between $360°$ and $720°$.

$$\sin 2\vartheta = \tan \vartheta$$

(4) [5 points] What is the whole circle bearing from point $A = (0.8586, -4.4739)$ to $B = (-1.2040, -2.3039)$?

(5) [5 points] Paris and Vancouver are approximately on the same latitude $(49°\text{N})$. How far apart are they going along their circle of latitude? Paris is at $2.5°\text{E}$ longitude and Vancouver at $123°\text{W}$.

(6) [3 points] Solve the following equation in $\mathbb{R}$. (This question is intended for students keen to achieve an excellent grade. Even though it is a challenging question, it is worth only 10% of the total grade.)

$$2 \cot 2\vartheta = \csc \vartheta$$