SA7 (Continues…) Version A

[System of Equations and Vectors]

1. (3 pts)

Given that m, n and k are real numbers.

Solve system of equations $\begin{cases} m+2n-k=3 \\ 3m+7n-5k=14 \\ -2m-n-3k=8 \end{cases}$

2. (3 pts) Define vectors $\vec{u}=m\vec{i}+n\vec{j}$ and $\vec{v}=k\vec{i}+\vec{j}$, where m, n and k are from question 1, find $\vec{u}\cdot\vec{v}$

3. (3 pts) Continues from question 2, what is the area of the triangle formed by the origin , end points of vector $\vec{u}$ and vector $\vec{v}$?

[Trigonometric equations]

4. (3 pts) if $x\in[0,2\pi)$, solve $\sin 2x=2\sin x$

(exact value)

[Application]

5. **Height of a Tree(3 pts)**

A tree is on a hillside of slope 15° (from horizontal). 75 feet downhill from where the tree is, the angle of elevation at the top of the tree is 65°. Find the height of the tree. (round to the whole feet)