RMIT UNIVERSITY

MATH 2167 Mathematics 1

Associate Degree in Engineering
College of VE, Future Technologies

Tutorial 1
Vector Algebra

Question 1

If $\boldsymbol{a} = \boldsymbol{i} + 2\boldsymbol{k}$ and $\boldsymbol{b} = 7\boldsymbol{i} + 6\boldsymbol{j} + 6\boldsymbol{k}$, then find

i. $2\boldsymbol{a} - 5\boldsymbol{b}$

ii. $\boldsymbol{a} \cdot \boldsymbol{b}$

iii. the angle between $\boldsymbol{a}$ and $\boldsymbol{b}$

iv. $\boldsymbol{a} \times \boldsymbol{b}$

v. the vector resolute of $\boldsymbol{b}$ in the directions of $\boldsymbol{a}$.

vi. the vector resolute of $\boldsymbol{b}$ perpendicular to $\boldsymbol{a}$.

Question 2

If $\boldsymbol{p} = 3\boldsymbol{i} + t\boldsymbol{j} + 6\boldsymbol{k}$ and $\boldsymbol{q} = 2\boldsymbol{i} - 8\boldsymbol{j} + 4\boldsymbol{k}$ find the value of the scalar t so that $\boldsymbol{p}$ and $\boldsymbol{q}$ are:

i. parallel

ii. perpendicular

Question 3

Find the area of the triangle with the vertices $P(1,1,1)$, $Q(2,3,3)$ and $R(4,1,2)$.