No. Date

Name :	Muhammad Syarif Zakwan bin Abdul Khabir	Total Marks :
ID :	242FC243VT	(/ 14)
Group :	TC1L	

1. $u \cdot v = |u||v| \cos\theta$

$2(3) + 2(-1) + 1(-1) = \sqrt{2^2+(-1)^2+1^2}\sqrt{3^2+2^2+(-1)^2}\cos\theta$

$3 = \sqrt{6}\sqrt{14}\cos\theta$

$\frac{3}{\sqrt{6}\sqrt{14}} = \cos\theta$

$\theta = 70.89°$ //

2. $u \times v = \begin{vmatrix} \underset{\sim}{i} & \underset{\sim}{j} & \underset{\sim}{k} \\ -1 & 1 & 0 \\ 1 & -1 & 1 \end{vmatrix} = \begin{vmatrix} 1 & 0 \\ -1 & 1 \end{vmatrix}\underset{\sim}{i} - \begin{vmatrix} 1 & 0 \\ 1 & 1 \end{vmatrix}\underset{\sim}{j} + \begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix}\underset{\sim}{k}$

$= [1(1) - (-1)(0)]\underset{\sim}{i} - [1(1) - 1(0)]\underset{\sim}{j}$

$+ [1(-1) - 1(1)]\underset{\sim}{k}$

$= \underset{\sim}{i} - \underset{\sim}{j} - 2\underset{\sim}{k}$

$= \langle 1, -1, -2 \rangle$

$|u \times v| = \sqrt{1^2+(-1)^2+(-2)^2}$

$= \sqrt{6}$

unit vector $= \frac{\underset{\sim}{i} - \underset{\sim}{j} - 2\underset{\sim}{k}}{\sqrt{6}}$

$= \frac{\underset{\sim}{i}}{\sqrt{6}} - \frac{\underset{\sim}{j}}{\sqrt{6}} - \frac{2\underset{\sim}{k}}{\sqrt{6}}$ //

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3. i) $\vec{AB} = \vec{OB} - \vec{OA}$

$= \langle 1-0, 0-1, 1-1 \rangle$

$= \langle 1, -1, 0 \rangle$ //

$\vec{AC} = \vec{OC} - \vec{OA}$

$= \langle 1-0, 1-1, 0-1 \rangle$

$= \langle 1, 0, -1 \rangle$ //

ii) $\vec{AB} \times \vec{AC} = \begin{vmatrix} \underset{\sim}{i} & \underset{\sim}{j} & \underset{\sim}{k} \\ 1 & -1 & 0 \\ 1 & 0 & -1 \end{vmatrix}$

$= \begin{vmatrix} -1 & 0 \\ 0 & -1 \end{vmatrix} \underset{\sim}{i} - \begin{vmatrix} 1 & 0 \\ 1 & -1 \end{vmatrix} \underset{\sim}{j} + \begin{vmatrix} 1 & -1 \\ 1 & 0 \end{vmatrix} \underset{\sim}{k}$

$= [(-1)(-1) - 0(0)] \underset{\sim}{i} - [1(-1) - 1(0)] \underset{\sim}{j} + [1(0) - 1(-1)] \underset{\sim}{k}$

$= \underset{\sim}{i} - (-1) \underset{\sim}{j} + \underset{\sim}{k}$

$= \underset{\sim}{i} + \underset{\sim}{j} + \underset{\sim}{k}$

$= \langle 1, 1, 1 \rangle$ //

iii) $a(x - x_0) + b(y - y_0) + c(z - z_0) = 0$

$1(x - 0) + 1(y - 1) + 1(z - 1) = 0$

$x - 0 + y - 1 + z - 1 = 0$

$x + y + z - 2 = 0$

$x + y + z = 2$ //

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4.

Mass (kg)	Frequency, f	Midpoint, m	mf	m^2f
20-24	9	22	198	4356
25-29	11	27	297	8019
30-34	7	32	224	7168
35-39	6	37	222	8214
40-44	4	42	168	7056
45-49	3	47	141	6627
	$\Sigma f = 40$		$\Sigma mf = 1250$	$\Sigma m^2f = 41440$

$$\bar{x} = \frac{1250}{40}$$

$$= 31.25 \text{ //}$$

$$\sigma^2 = \frac{41440 - \frac{1250^2}{40}}{40 - 1}$$

$$\sigma^2 = 60.96 \text{ //}$$

$$\sigma = \sqrt{60.96}$$

$$\sigma = 7.81 \text{ //}$$