1a. $\sqrt{10}$ b. $\sqrt{14}$ c. $\begin{pmatrix}-3\\-5\end{pmatrix}$ d. not possible e. $\begin{pmatrix}0\\3\\3\end{pmatrix}$

f. $\begin{pmatrix}10\\4\\-24\end{pmatrix}$ g. -20 h. NA I. -2 j. 98.13°

i. ~~cos θ = ...~~ k. $\begin{pmatrix}\frac{1}{\sqrt{11}}\\ \frac{1}{\sqrt{11}}\\ \frac{3}{\sqrt{11}}\end{pmatrix}$

2. ~~...~~ $a(t) = \begin{bmatrix}2\\3\end{bmatrix} + t\begin{bmatrix}-2\\1\end{bmatrix}$

3. $\frac{\sqrt{5}}{5}$

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

or $ax + by + cz = ax_0 + by_0 + cz_0$

normal Vector = $3x - 4y + 2z = \vec{n}$

$= \langle 3, -4, 2 \rangle$

$3(2) - 4(1) + 2(3) = 8$

$3x - 4y + 2z = 8$

5. ~~...~~ $\begin{bmatrix}-18\\-23\\4\end{bmatrix}$

6. $\begin{bmatrix}0\\0\\0\end{bmatrix}$ Cause V_2 is a multiple of V_1

7. ~~...~~ $= \begin{bmatrix}42\\-22\\-31\end{bmatrix} = x$ $\|x\| = 3\sqrt{366}$

8 $x = \begin{bmatrix}3 & 2\\-4 & 5\end{bmatrix}$ Det$(x) = 3 \times 5 - 2 \times -4$

$= 15 + 8$

$= 23$

inverse $= \frac{1}{23}\begin{bmatrix}5 & -2\\4 & 3\end{bmatrix} = \begin{bmatrix}\frac{5}{23} & -\frac{2}{23}\\ \frac{4}{23} & \frac{3}{23}\end{bmatrix}$

9. a. $A+B = \begin{matrix}2\\2\\6\end{matrix} + \begin{matrix}-2\\1\\-3\end{matrix} = \begin{matrix}0\\3\\3\end{matrix}$ b. $3B = \begin{bmatrix}6 & -6 & 3\\ 0 & -3 & -9\end{bmatrix}$

c. $A^T + B^T = [0\ 3\ 3]$ d. $[0\ 3\ 3]$ e. $CA = \begin{bmatrix} & & \\ & & \end{bmatrix}\begin{bmatrix}14 & -7 & 3\\ -14 & 7 & -3\end{bmatrix}$

f. AC = not possible g. $CB = \begin{bmatrix}2 & 1 & 10\\ -2 & -1 & -10\end{bmatrix}$ h. BD, not possible

i. $Cv = \begin{bmatrix}10\\-10\end{bmatrix}$ j. $\det(C) = 0$ k. C^{-1} = matrix is singular so can't be inverted.