# Corrections to Systems of Equations Notes

1/. Page 2: Transpose is obtained by rotating about the diagonal elements of a square matrix.

2/. Page 4: In Row Operations, the second operation is ii) (row 2) × (−1) + row 1 and (row 2) × (−1) + row 3.

3/. Page 5: At the top of the page, (row 1) × (−2) + (row 3).

4/. Page 5: The Kronecker Delta and ORTHONORMALITY.

Consider unit vectors in 3-D space $\hat{x}, \hat{y}, \hat{z}$.

Rewrite $\boxed{\hat{x}, \hat{y}, \hat{z}} \longrightarrow \boxed{\hat{x}_1, \hat{x}_2, \hat{x}_3}$. Now we know

$\boxed{\hat{x}\cdot\hat{x} = \hat{y}\cdot\hat{y} = \hat{z}\cdot\hat{z} = 1}$ and $\boxed{\hat{x}\cdot\hat{y} = \hat{y}\cdot\hat{z} = \hat{z}\cdot\hat{x} = 0}$.

(zero product)

We can recast the above products as,

$\boxed{\hat{x}_1\cdot\hat{x}_1 = \hat{x}_2\cdot\hat{x}_2 = \hat{x}_3\cdot\hat{x}_3 = 1}$, $\boxed{\hat{x}_1\cdot\hat{x}_2 = \hat{x}_2\cdot\hat{x}_3 = \hat{x}_3\cdot\hat{x}_1 = 0}$

Compactly we can write $\boxed{\hat{x}_i\cdot\hat{x}_j = \delta_{ij}} \rightarrow$ The Kronecker Delta.

i.) If $\boxed{i = j, \quad \delta_{ij} = 1}$ (normalisation condition)

ii.) If $\boxed{i \neq j, \quad \delta_{ij} = 0}$ (~~org~~ orthogonality condition)

Together $\boxed{\hat{x}_i\cdot\hat{x}_j = \delta_{ij}}$ (ORTHONORMALITY CONDITION).
(orthonormality)

5/. Page 11: $\boxed{a_{kk}^{(k)} x_k + \cdots + a_{kn}^{(k)} x_n = b_k^{(k)} \quad - (\underline{\underline{E_k}})}$

6/. Page 13: At the bottom $\boxed{\frac{7}{4} x_2 = \frac{7}{4}}$.

7/. Page 15: In the middle $\boxed{x_{11} = 2}$.

8/. Page 18: $\boxed{x_2^{(k+1)} = \frac{1}{10}\left[b_2 - 2x_1^{(k+1)} - 3x_3^{(k)}\right]}$.