

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Advanced Linear Algebra

Subject Code : CCN2236

Session : Semester One, 2013/14

Numerical Answers

Question B1

(a) (i) $\{(-1, 0, 1, 0)^T, (1, -1, 0, 1)^T\}$

(ii) $\{(1, 0, 3, -1)^T, (2, 1, 2, 0)^T\}$

(b) $\{(-3, 4, 1, 0)^T, (1, -2, 0, 1)^T\}$

Question B3

(b) $\hat{\beta}_0 = \frac{4}{3}, \hat{\beta}_1 = -\frac{5}{3}$ and $\hat{\beta}_2 = \frac{9}{28}$

Question C1

(c) (i) $\begin{pmatrix} 8 & -2 & 2 \\ -2 & 1 & 0 \\ 2 & 0 & 1 \end{pmatrix}$

Question C2

(a) $\left\{ \left(\frac{1}{3}, \frac{2}{3}, 0, \frac{2}{3} \right)^T, \left(-\frac{2}{3}, \frac{2}{3}, 0, -\frac{1}{3} \right)^T, \left(\frac{2}{3\sqrt{2}}, \frac{1}{3\sqrt{2}}, -\frac{1}{\sqrt{2}}, -\frac{2}{3\sqrt{2}} \right)^T \right\}$

(b) (i) $\left(-\frac{1}{9}, \frac{17}{18}, -\frac{1}{6}, \frac{1}{9} \right)^T$

(ii) 3

Question C3

(d) $\frac{1}{2^{2236}} I_n$