KEY

Section 1: Algebra

1.1 -1
1.2 b,c
1.3 a,b,c
1.4 $I = \{f \in \mathcal{C}[0,1] \mid f(x) = 0 \text{ for all } x \in S\}$ for any subset S of $[0,1]$
1.5 a,c
1.6 Any two linearly independent vectors belonging to V (Example: $(1,0,1,-1)$ and $(0,1,1,-1)$)
1.7 a
1.8

$$\begin{bmatrix} 2 & 0 & 0 & 0 \\ 0 & 5 & 2 & 0 \\ 0 & 0 & 8 & 6 \\ 0 & 0 & 0 & 11 \end{bmatrix}$$

1.9 $1 + x + x^2 + x^3$
1.10 $x^3 - x^2 - 8x - 16 = 0$

Section 2: Analysis

2.1 b,c
2.2 $\frac{4}{e}$
2.3 a. Limit does not exist; b. 1; c. 0
2.4 a. Emptyset; b. $\{-1, +1\}$
2.5 $e^{a\frac{f'(a)}{f(a)}}$
2.6 b,c
2.7 a,b,c
2.8 $1 < x < 2$
2.9 b,c
2.10 $\frac{2a}{\sqrt{3}}$

Section 3: Miscellaneous

3.1 a,b,c
3.2 n
3.3 $\frac{1}{n+1}$
3.4 $4abc$
3.5 a,b,c
3.6 $4^{\frac{1}{3}}$
3.7 $2\log 2 - 1$
3.8 $2e - 5$
3.9 $\frac{3\sqrt{3}}{4}$
3.10 $7x - 3y - z + 89 = 0$

Note: Please accept any answer which is correct, but expressed in an equivalent, though different, form, where applicable.