

## 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  $\frac{2a}{\sqrt{3}}$

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.