

KEY**Section 3: Miscellaneous****Section 1: Algebra**

1.1 $\sigma\tau = (187)(354), \tau\sigma = (147)(385)$

1.2 a,b,c

1.3 c

1.4 $4x$

1.5 1

1.6 $x^T x = 1$

1.7 Any five linearly independent matrices in W .

1.8 b,c

1.9 a

1.10 $2 \pm \sqrt{3}, 3 \pm 2\sqrt{2}$

3.1 0

3.2 a,b,c

3.3 $\frac{6}{35}$

3.4 $\cos^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{3}$

3.5 $\frac{1}{x} + \frac{1}{y} = 2$

3.6 $\frac{1}{2} \left[\left(\frac{4}{3}\right)^{\frac{2}{3}} - \frac{7}{6} \right]$

3.7 $\frac{N}{2}(2a + (N^2 - 1)d)$

3.8 $\log N$

3.9 b,c

3.10 a,b,c

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

Section 2: Analysis

2.1 $e^{-\frac{1}{2}}$

2.2 $\frac{4}{e}$

2.3 $e^{\frac{k(k+1)}{2a}}$

2.4 $2f(a)$

2.5 0

2.6 a,b

2.7 a. conditionaly convergent; b. absolutely convergent; c. divergent

2.8 b,c

2.9 $f(z) = \frac{1}{2} + \sum_{n=1}^{\infty} \frac{1}{2^{n+1}}(z-5)^n$

2.10 $\frac{1}{2}(1-i)$