

Section 1: Algebra

1.1 $3r - pq$

1.2 9

1.3 12

1.4 a

1.5 (1.4a) The multiplicative group of non-zero reals

1.6 a. Ideal; b. Subring, but not an ideal; c. Ideal

1.7 2, 3, 4, 5, 7, 8, 9

1.8 Any three linearly independent matrices in W .

1.9

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & -2 & 1 & 0 \\ 0 & 0 & -3 & 0 & 1 \end{bmatrix}$$

1.10 b,c

Section 2: Analysis

2.1 a,b,c

2.2 3

2.3 c

2.4 a,b,c

2.5 c

2.6 $h = 2r$

2.7 c

2.8 43

2.9

$$1 + \sum_{n=1}^{\infty} (n+1)(z+1)^n$$

2.10 c

3.1 (a) 60; (b) 24

3.2 $\frac{1}{n+1}$

3.3 Any number of the form $301 + 420k$, $k \in \mathbb{N} \cup \{0\}$

3.4 3

3.5 $\frac{\sqrt{3}}{9}s^2$

3.6 π

3.7 b

3.8 $(-3, -2, 0)$

3.9 $8(|x|^3 + |y|^3) = c$

3.10 a,b,c

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