

**KEY****Section 3: Miscellaneous****Section 1: Algebra****1.1** 36**1.2** 2**1.3** b,c**1.4** b. The multiplicative group  $\{+1, -1\}$ .c. The multiplicative group  $\mathbb{C} \setminus \{0\}$ .**1.5** a,c**1.6** b**1.7** a,b**1.8** b,c**1.9** a,b,c**1.10** c**3.1**  $E \Delta F = (E \setminus F) \cup (F \setminus E)$ **3.2** c**3.3**  $\frac{2^n}{n+1}$ **3.4**  $D = \cup_{\varepsilon > 0} \cap_{n=1}^{\infty} \cup_{k=n}^{\infty} E_k(\varepsilon)$ **3.5**  $2^{14}$ **3.6**  $\pi$ **3.7**  $x^2 + y = 2$ **3.8**  $x + 2y - 3z = 3$ **3.9** 498**3.10**

$$\binom{n}{m} \binom{m}{k} = \binom{n}{k} \binom{n-k}{\ell}$$

Note:  $k$  and  $\ell$  can be interchanged on either side.

**Section 2: Analysis****2.1** b,c**2.2** b,c**2.3**  $-2 \leq x \leq 0$ **2.4** a,c**2.5** a,c**2.6** a,b**2.7**

$$\frac{ne^{(n+2)x} - (n+1)e^{(n+1)x} + e^x}{(e^x - 1)^2}$$

**2.8** >**2.9**  $\frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6} \cdot \frac{1}{7}$ **2.10**  $\frac{1}{\sqrt{2}} \log(\sqrt{2} + 1)$