MATHEMATICS ENRICHMENT CLUB.
Solution Sheet 11, August 1, 2016

1. In the sum $29x + 30y + 31z = 366$, only the values of x and z a ects the last digit of 366. In particular, $z = x \quad 4 + 10i$ for some integer i. Therefore,

$$\begin{aligned} 29x + 30y + 31z &= 366 \\ 60x + 30y \quad 124 + 310i &= 366 \\ 60x + 30y + 310i &= 490; \end{aligned} \tag{1}$$

and

$$x + y + z = 2x \quad 4 + 10i + y: \tag{2}$$

Since we wish to minimise the sum $x + y + z$, we want to make jij as small as possible. By (1), it is clear that the smallest possible jij is $i = 1$. Therefore, (1) becomes

Next, to count the number of ways to form the rst 4 digits of x