Q3: We first claim that every nontrivial subgroup of $\mathbb{Z}$ must be infinite. If $H \leq G$ with $|H| > 1$, then take $a \in H, a \neq 0$. We must have for any $n \in \mathbb{Z}$, $an \in H$ since multiplication with integers is equivalent to repeated addition or subtraction. Therefore H must be infinite. We claim that the only subgroups of $\mathbb{Z}$ are $n\mathbb{Z}$ for $n \in \{0, 1, 2 \ldots\}$. Let H be a nontrivial subgroup of $\mathbb{Z}$. We define $Y = \{\gcd(|g|, |h|) : g, h \in H\}$. Y is a nonempty set and this is bounded below by 0, hence we can apply the well ordering principle. There must exist a minimal element $d \in Y$. We now claim that $H = d\mathbb{Z}$. Note that by bezouts identity there exists $a, b \in \mathbb{Z}$ such that $d = ag + bh$ for some $g, h \in \mathbb{Z}$, namely the g, h satisfying $\gcd(g, h) = d$. We now claim that $H = d\mathbb{Z}$. Suppose that there is some $a \in H$ that cannot be written as $dz = a$ for some $z \in H$. This would imply that $\gcd(d, a) < d$ contradicting minimality of d. Hence we have that any subgroup of $\mathbb{Z}$ must be of the form $d\mathbb{Z}$.