Q1a: Since $a|b$, we have for some $k \in \mathbb{Z}$, $ak = z$, and since $b|c$ for some $l \in \mathbb{Z}$, $lb = c$. Therefore, $c = lb = lka$ and so $a|c$.

Q1b: Since $a|b$, we have for some $k \in \mathbb{Z}$, $ak = z$, and since $c|d$ we have for some $l \in \mathbb{Z}$, $lc = d$. Therefore, we have $bd = (ka)(lc) = (kl)(ac)$ and so we conclude that $ac|bd$

Q1c: Let $m \neq 0$. We note that $a|c \iff ak = b$ for some k $\in Z \iff mak = bm \iff ma|mb$

Q1d: Since $d|a$, for some k, $dk = a$. Since $a \neq 0$, we have that $k \neq 0$. So thus

$$|dk| = |a| \implies |k||d| = |a| \implies |d| \leq |a|$$

With equality holding when $|k| = 1$