Reading 1.2

$\boxed{1.10}$

(a) We use proof by contradiction. Suppose n is not even, then $n = 2k+1$ for some $k \in \mathbb{N}$.
Then, $n^2 = (2k+1)^2$
$= 4k^2+4k+1 = 2(2k^2+2k)+1 = 2l+1$
Since $n^2 = 2l+1$, where $l = 2k^2+2k$
it is not even. This is a contradiction.
Therefore, n must be even.

(b) ~~Suppose~~ We use proof by contradiction. Suppose n is not a multiple of 3. Then,
$n = 3k+l$ for some $k \in \mathbb{N}$ and $l \in \{1,2\}$
Then, $n^2 = (3k+l)^2$
$n^2 = 9k^2+6kl+l^2$
There are 2 cases:
$l=1$: $n^2 = 9k^2+6k+1 = 3(3k^2+2k)+1$
$= 3p+1$ where $p = 3k^2+2k \in \mathbb{N}$
Since $n^2 = 3p+1$, it is not a multiple of 3.
$l=2$: $n^2 = 9k^2+12k+4 = 3(3k^2+4k+1)+1$
$= 3q+1$ where $q = 3k^2+4k+1$
Since $n^2 = 3q+1$, it is not a multiple of 3.

By case analysis, n^2 is not a multiple of 3. This is a contradiction. Therefore n is a multiple of 3.

(c)

$\boxed{1.11}$

$n=6$, $m=9$ is an example such that n^2 is a multiple of m, but n is not a multiple of m.
If $m<n$, then we can have $n=6$, $m=4$ as an example.