

Homework Solutions - Section 2.4

1.

(a)

Let m and n be the two even integers.

We can write, $m = 2j$ and $n = 2k$ where $j, k \in \mathbb{Z}$

Therefore, $m + n = 2j + 2k$ which is divisible by 2 (i.e., it is even).

(b)

Let m , n , and p be the three even integers.

We can write, $m = 2i+1$, $n = 2j+1$, and $p = 2k + 1$ where $i, j, k \in \mathbb{Z}$

Therefore, $m + n + p = 2i + 2j + 2k + 3$ must be odd.

(c) $2 + 3 = 5$ is a counterexample. (So is $2 + 5 = 7$, etc.)

3. For $n \in \mathbb{Z}$,

(a) $n + (n+1) + (n+2) = 3n + 3$ which is divisible by 3.

(b) $n + (n+1) + (n+2) + (n+3) = 4n + 6$ which is not divisible by 4.

(c) $n + (n+1) + (n+2) + (n+3) + (n+4) = 5n + 10$ which is divisible by 5.