

Worksheet 5 Solution

March 15, 2020

Question 1

- $\forall n, p \in \mathbb{N}, \text{Odd}(n) \wedge \text{Odd}(p) \Rightarrow \text{Odd}(n \times p)$

Then, $\exists k, m \in \mathbb{Z}, n = 2k - 1, p = 2m - 1$ by the definition of odd numbers

Then,

$$n \times p = (2k - 1)(2m - 1) \tag{1}$$

$$= 2k2m - 2k - 2m + 1 \tag{2}$$

$$= (2k2m - 2k - 2m + 2) - 1 \tag{3}$$

$$= 2(2km - k - m + 1) - 1 \tag{4}$$

$$= 2l - 1 \tag{5}$$

where $l = 2km - k - m + 1$.

Since $l \in \mathbb{Z}$, it follows from the definition of odd number that the product of two odd numbers is odd.

Question 2

Question 3

Question 4