Task

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a) Number of mice = 18.
Number of group = 3.

Since the groups are equall large.

The number of mice in each group = $\frac{18}{3} = 6$

the number of ways of placement of mice = 18!

For each group the placement of mice = 6!

hence the require number of ways

$$\frac{18!}{6!6!6!}$$

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b) $(N, +)$

$N = \{1, 2, 3, 4 \ldots\}$

To prove that it is a monoid we have to prove the following laws:

a) closure law if $(a, b) \in N$

$a+b \in N$

eg $(1,2) \in N$

$1+2 = 3 \in N$

hence it is closure law

~~b) As~~

b) Associative law :- if $(a, b, c) \in N$

$a+(b+c) = (a+b)+c$

let $(1, 2, 3) \in N$

$1+(2+3) = (1+2)+3$

$6 = 6$

hence it is associative

c) identity law : $1 \in N$

since 1 is the part of N

hence it is identity

since all of the above laws are proved so $(N, +)$ is a monoid.

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