Exercise 1.4

Question 2:

Prove that on and only one out of n, (n + 2) and (n + 4) is divisible by 3, where n is any positive integer.

Answer 2:

Let a = n, b = n + 2 and c = n + 4

∴ (a, b, c) = (n, n + 2, n + 4)

Where n is any positive integer i.e. n = 1, 2, 3…

At n =1; (a, b, c) = (1, 1 + 2, 1+ 4,) = (1, 3, 5)

At n =2; (a, b, c) = (2, 2 + 2, 2 + 4) = (2, 4, 6)

At n =3; (a, b, c) = (3, 3 + 2, 3 + 4) = (3, 5, 7)

At n =4; (a, b, c) = (4, 4 + 2, 4 + 4) = (4, 6, 8)

At n =5; (a, b, c) = (5, 5 + 2, 5 + 4) = (5, 7, 9)

At n =6; (a, b, c) = (6, 6 + 2, 6 + 4) = (6, 8, 10)

At n =7; (a, b, c) = (7, 7 + 2, 7 + 4) = (7, 9, 11)

At n =8; (a, b, c) = (8, 8 + 2, 8 + 4) = (8, 10, 12)

We observe that each set (a, b, c) consist of one and only one number which is multiple of 3 i.e., divisible by 3.

Hence one and only on out of n, (n + 2) and (n + 4) is divisible by 3, where, n is any positive integer.