EXERCISE 1.1

Choose the correct answer from the given four options in the following questions:

1. For some integer m, every even integer is of the form:

(A) m (B) m +1

(C) 2m (D) 2m+1

Solution:

(C)2m

Explanation:

Even integers are those integers which are divisible by 2.

Hence, we can say that every integer which is a multiple of 2 must be an even integer.

Therefore, let us conclude that,

for an integer 'm', every even integer must be of the form

$2 \times m = 2m$.

Hence, **option (C)** is the correct answer.

2. For some integer q, every odd integer is of the form

(A) q (B) q +1

(C) 2g (D) 2q +1

Solution:

(D) 2q+1

Explanation:

Odd integers are those integers which are not divisible by 2.

Hence, we can say that every integer which is a multiple of 2 must be an even integer, while 1 added to every integer which is multiplied by 2 is an odd integer.

Therefore, let us conclude that,

for an integer 'q', every odd integer must be of the form

$(2 \times q)+1 = 2q+1$.

Hence, **option (D)** is the correct answer.

3. $n^2 – 1$ is divisible by 8, if n is

(A) an integer (B) a natural number

(C) an odd integer (D) an even integer

Solution:

(C) an odd integer

Explanation:

Let $x = n^2 – 1$

In the above equation, n can be either even or odd.

Let us assume that n= even.

So, when n = even i.e., n = 2k, where k is an integer,

We get,

$\Rightarrow x = (2k)^2-1$

$\Rightarrow x = 4k^2 – 1$

At k = -1, x = $4(-1)^2$ - 1 = 4 - 1 = 3, is not divisible by 8.
At k = 0, x = $4(0)^2$ - 1 = 0 - 1 = -1, is not divisible by 8
Let us assume that n= odd:
So, when n = odd i.e., n = 2k + 1, where k is an integer,
We get,
⇒ x = 2k + 1
⇒ x = $(2k+1)^2$ - 1
⇒ x = $4k^2$ + 4k + 1 - 1
⇒ x = $4k^2$ + 4k
⇒ x = 4k(k+1)
At k = -1, x = 4(-1)(-1+1) = 0 which is divisible by 8.
At k = 0, x = 4(0)(0+1) = 4 which is divisible by 8 .
At k = 1, x = 4(1)(1+) = 8 which is divisible by 8.

From the above two observation, we can conclude that, if n is odd, if n odd, n^2-1 is divisible by 8.
Hence, **option (C)** is the correct answer.

4. If the HCF of 65 and 117 is expressible in the form 65m – 117, then the value of m is
(A) 4 **(B) 2**
(C) 1 **(D) 3**
Solution:
(B) 2
Explanation:
Let us find the HCF of 65 and 117,

117 = 1×65 + 52

65 = 1× 52 + 13

52 = 4 ×13 + 0

Hence, we get the HCF of 65 and 117 = 13.

According to the question,

65m - 117 = 13

65m = 117+13 = 130

∴ m =130/65 = 2

Hence, **option (B)** is the correct answer.

5. The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is
(A) 13 **(B) 65**
(C) 875 **(D) 1750**
Solution:
(A) 13
Explanation:
According to the question,
We have to find the largest number which divides 70 and 125, leaving remainders 5 and 8.

This can be also written as,
To find the largest number which exactly divides (70 - 5), and (125 - 8)
The largest number that divides 65 and 117 is also the Highest Common Factor of 65 and 117
Therefore, the required number is the HCF of 65 and 117

Factors of 65 = 1, 5, 13, 65
Factors of 117 = 1, 3, 9, 13, 39, 117
Common Factors = 1, 13
Highest Common factor (HCF) = 13
i.e., the largest number which divides 70 and 125, leaving remainders 5 and 8, respectively = 13
Hence, **option (A)** is the correct answer.