EXERCISE 1.1

Write the correct answer in each of the following:

1. Every rational number is

(A) a natural number
(B) an integer
(C) a real number
(D) a whole number

Solution:

(C) a real number

Explanation:

We know that rational and irrational numbers taken together are known as real numbers. Therefore, every real number is either a rational number or an irrational number. Hence, every rational number is a real number.

Hence, (C) is the correct option.

2. Between two rational numbers

(A) there is no rational number
(B) there is exactly one rational number
(C) there are infinitely many rational numbers
(D) there are only rational numbers and no irrational numbers

Solution:

(C) there are infinitely many rational numbers

Explanation:

Between two rational numbers there are infinitely many rational number.

Hence, (C) is the correct option.

3. Decimal representation of a rational number cannot be

(A) terminating
(B) non-terminating
(C) non-terminating repeating
(D) non-terminating non-repeating

Solution:

(D) non-terminating non-repeating

Explanation:

The decimal representation of a rational number cannot be non-terminating and non- repeating.

Hence, (D) is the correct option

4. The product of any two irrational numbers is

(A) always an irrational number
(B) always a rational number
(C) always an integer
(D) sometimes rational, sometimes irrational

Solution:

(D) sometimes rational, sometimes irrational

Explanation:
The product of any two irrational numbers is sometimes rational and sometimes irrational.
Hence, (D) is the correct option

5. The decimal expansion of the number √2 is

(A) a finite decimal
(B) 1.41421
(C) non-terminating recurring
(D) non-terminating non-recurring

Solution:

(D) non-terminating non-recurring
Explanation:
The decimal expansion of the number √2 = 1.41421356237…
Hence, (D) is the correct option

6. Which of the following is irrational?

(A) √4/√9
(B) √12/√3
(C) √7
(D) √81

Solution:

(C) √7
Explanation:
(A) √4/√9 = 2/3
(B) √12/√3 = 2√3/√3 = 2
(C) √7 = 2.64575131106
(D) √81 = 9
Here, (C) √7 = 2.64575131106, is a non terminating decimal expansion.
Hence, (C) is the correct option

7. Which of the following is irrational?

(A) 0.14
(B) $0.14\overline{16}$
(C) $0.\overline{1416}$
(D) 0.4014001400014...

Solution:

(D) 0.4014001400014…
Explanation:
A number is irrational if and only of its decimal representation is non-terminating and non-recurring.
(A) is a terminating decimal and therefore cannot be an irrational number.
(B) is a non-terminating and recurring decimal and therefore cannot be irrational.
(C) is a non-terminating and recurring decimal and therefore cannot be irrational.
(D) is a non-terminating and non-recurring decimal and therefore is an irrational number.
Hence, (D) is the correct option.

8. A rational number between √2 and √3 is
(A) (√2+√3)/2
(B) (√2. √3)/2
(C) 1.5
(D) 1.8
Solution:

(C) 1.5
Explanation:
√2 =1.4142135.... and √3 =1.732050807....
(A) (√2+√3)/2 = 1.57313218497… is a non-terminating and non-recurring decimal and therefore is an irrational number.
(B) (√2. √3)/2 = 1.22474487139… is a non-terminating and non-recurring decimal and therefore is an irrational number.
(C) 1.5 is a terminating decimal and therefore is a rational number.
(D) 1.8 is a terminating decimal and therefore is a rational number.
Here both 1.5 and 1.8 are rational numbers. But, 1.8 does not lie in between √2 =1.4142135.... and √3 =1.732050807.... Whereas 1.5 lies in between √2 =1.4142135.... and √3 =1.732050807....
Hence, (C) is the correct option.

9. The value of 1.999... in the form *p/q*, where *p* and *q* are integers and *q* ≠ 0 , is
(A) 19/10
(B) 1999/1000
(C) 2
(D) 1/9
Solution:

(C) 2
Explanation:
(A) 19/10 = 1.9
(B) 1999/1000= 1.999
(C) 2
(D) 1/9= 0.111….
Let x = 1.9999..... --- (1)
Multiply equation (1) with 10
10x = 19.9999..... --- (2)
Subtract equation (1) from equation(2) ,
We get,
9x = 18
x = 18 / 9
x = 2
Therefore,
x = 1.9999... = 2
Hence, (C) is the correct option.

10. 2√3 + √3 is equal to
(A) 2√6
(B) 6

(C) $3\sqrt{3}$
(D) $4\sqrt{6}$

Solution:

(C) $3\sqrt{3}$

Explanation:

$2\sqrt{3} + \sqrt{3}$

Taking $\sqrt{3}$ common,

We get,

$\sqrt{3}(2+1) = \sqrt{3}(3) = 3\sqrt{3}$

Hence, (C) is the correct option.