

CBSE MCQs
Class 10 Maths
Chapter 1: Real Numbers

1. The decimal expansion of the rational number $\frac{33}{2^2 \cdot 5}$ will terminate after

- (A) one decimal place
- (B) two decimal places
- (C) three decimal places
- (D) more than 3 decimal places

Answer: B

Explanation: The termination of any rational number depends upon the power of 2 in the prime factorization of denominator.

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

- (A) m
- (B) $m + 1$
- (C) $2m$
- (D) $2m + 1$

Answer: D

Explanation: As the number $2m$ will always be even, so if we add 1 to it then, the number will always be odd.

3. If two positive integers a and b are written as $a = p^3q^2$ and $b = pq^3$; p, q are prime numbers, then HCF (a, b) is:

- (A) pq
- (B) pq^2
- (C) p^3q^3
- (D) p^2q^2

Answer: B

Explanation: Since $a = p \times p \times p \times q \times q$,
 $b = p \times q \times q \times q$
Therefore H.C.F of a and b = pq^2

4. The product of a non-zero number and an irrational number is:

- (A) always irrational
- (B) always rational
- (C) rational or irrational
- (D) one

Answer: A

Explanation: Product of a non-zero rational and an irrational number is always irrational
i.e.,

$$\frac{3}{4} \times \sqrt{2} = (\text{rational}) \times (\text{irrational}) = \text{irrational}.$$

5. 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

Answer: B

Explanation: By Euclid's division algorithm,
 $b = aq + r$

$$117 = 65 \times 1 + 52$$

$$65 = 52 \times 1 + 13$$

$$52 = 13 \times 4 + 0$$

$$\text{H.C.F}(65, 117) = 13$$

$$\text{Since, H.C.F} = 65m - 117$$

$$\text{So } 65m - 117 = 13$$

$$\Rightarrow 65m = 130$$

$$\Rightarrow m = 2$$

6. The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is

(A) 13

(B) 65

(C) 875

(D) 1750

Answer: A

Explanation: Since 5 and 8 are the remainders of 70 and 125, respectively. Thus after subtracting these remainders from the numbers, we have the numbers $65 = (70 - 5)$, $117 = (125 - 8)$ which is divisible by the required number.

Now required number = H.C.F of (65,117)

$$117 = 65 \times 1 + 52$$

$$65 = 52 \times 1 + 13$$

$$52 = 13 \times 4 + 0$$

$$\text{H.C.F}(65,117) = 13$$

7. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; a, b being prime numbers, then LCM (p, q) is

(A) ab

(B) a^2b^2

(C) a^3b^2

(D) a^3b^3

Answer: C

Explanation:

$$p = a \times b \times b$$

$$q = a \times a \times a \times b$$

Since L.C.M is the product of the greatest power of each prime factor involved in the numbers

Therefore, L.C.M of p and q = a^3b^2

8. The values of the remainder r, when a positive integer a is divided by 3 are:

(A) 0, 1, 2, 3

(B) 0, 1

(C) 0, 1, 2

(D) 2, 3, 4

Answer: C

Explanation:

According to Euclid's division lemma,

$$a = 3q + r, \text{ where } 0 \leq r < 3$$

As the number is divided by 3. So the remainder cannot be greater than divisor 3 also r is an integer. Therefore, the values of r can be 0, 1 or 2.

9. $\frac{987}{10500}$ will have

(A) Terminating decimal expansion

(B) Non-Terminating Non repeating decimal expansion

(C) Non-Terminating repeating decimal expansion

(D) None of these

Answer: A

Explanation: After simplification,

$$\begin{aligned} \frac{987}{10500} &= \frac{47}{500} \\ &= \frac{47}{5^3 \times 2^2} \end{aligned}$$

As the denominator has factor $5^3 \times 2^2$ and which is of the type $5^m \times 2^n$, So this is a terminating decimal expansion.

10. A rational number in its decimal expansion is 327.7081. What would be the prime factors of q when the number is expressed in the p/q form?

(A) 2 and 3

(B) 3 and 5

(C) 2, 3 and 5

(D) 2 and 5

Answer: D

Explanation: This can be explained as,

$$327.7081 = \frac{3277081}{10000} = \frac{p}{q}$$

$$\therefore q = 10000 = 10^4$$

$$= (2 \times 5)^4$$

$$= 2^4 \times 5^4$$

11. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

- (A) 10
- (B) 100
- (C) 2060
- (D) 2520

Answer: D

Explanation: Factors of 1 to 10 numbers

$$1 = 1$$

$$2 = 1 \times 2$$

$$3 = 1 \times 3$$

$$4 = 1 \times 2 \times 2$$

$$5 = 1 \times 5$$

$$6 = 1 \times 2 \times 3$$

$$7 = 1 \times 7$$

$$8 = 1 \times 2 \times 2 \times 2$$

$$9 = 1 \times 3 \times 3$$

$$10 = 1 \times 2 \times 5$$

L.C.M of numbers from 1 to 10 is = $1 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7 = 2520$

L.C.M of numbers from 1 to 10 is =

12. $n^2 - 1$ is divisible by 8, if n is

- (A) an integer

- (B) a natural number
- (C) an odd integer greater than 1
- (D) an even integer

Answer: C

Explanation: n can be even or odd

Case 1: If n is even

$$n = 2k$$

Then

$$a = (2k)^2 - 1$$

$$a = 4k^2 - 1$$

$$\text{For } k = -1$$

$$4(-1)^2 - 1 = 3, \text{ not divisible by } 8$$

Case 2: If n is odd

$$n = 2k + 1$$

Then

$$a = (2k + 1)^2 - 1$$

$$a = 4k^2 + 4k + 1 - 1$$

$$a = 4k^2 + 4k$$

$$\text{For } k = 1$$

$$a = 4k^2 + 4k = 8$$

Which is divisible by 8.

Similarly we can check for any integer.

13. If n is a rational number, then $5^{2n} - 2^{2n}$ is divisible by

- (A) 3
- (B) 7
- (C) Both 3 and 7
- (D) None of these

Answer: C

Explanation:

$5^{2n} - 2^{2n}$ is of the form $a^{2n} - b^{2n}$ which is divisible by both $(a + b)$ and $(a - b)$.
So, $5^{2n} - 2^{2n}$ is divisible by both 7, 3.

14. The H.C.F of 441, 567 and 693 is

- (A) 1
- (B) 441
- (C) 126
- (D) 63

Answer: D

Explanation:

$$693 = 3 \times 3 \times 7 \times 7$$

$$567 = 3 \times 3 \times 3 \times 3 \times 7$$

$$441 = 3 \times 3 \times 7 \times 11$$

Therefore H.C.F of 693, 567 and 441 is 63.

15. On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?

- (A) 2520cm
- (B) 2525cm
- (C) 2555cm
- (D) 2528cm

Answer: A

Explanation: We need to find the L.C.M of 40, 42 and 45 cm to get the required minimum distance.

$$40 = 2 \times 2 \times 2 \times 5$$

$$42 = 2 \times 3 \times 7$$

$$45 = 3 \times 3 \times 5$$

$$\text{L.C.M.} = 2 \times 3 \times 5 \times 2 \times 2 \times 3 \times 7 = 2520$$