

MATHS BASEMAKER
Class 10 Mathematics — Chapter 1: Real
Numbers
Chapter Test Paper

Q1. If x and y are co-prime numbers, then $HCF(x, y)$ is:

(a) 5 (b) 2 (c) 1 (d)

Q2. $\sqrt{-16}$ is:

**(a) irrational number (b) rational number (c) negative irrational
(d) None**

Q3. $HCF(161, p)$ is 23 and their LCM is 1449. Find the value of p .

(a) 205 (b) 107 (c) 414 (d) 207

Q4. Evaluate $(2 - \sqrt{3})^2$. The result is:

**(a) An irrational number (b) A rational number (c) A whole
number (d) None of these**

Q5. Find the smallest number which exactly divides 368 and 621.

Q6. Four bells toll together at 10:00 a.m. They toll after 4, 6, 8 and 10 seconds respectively. At what time will they toll together again?

Q7. What is the power of 3 in the prime factorization of 32760?

Q8. If p and q be positive integers and $\text{HCF}(p^3 + q^3, p^2 - pq + q^2) = pq$, prove mathematically that $p = q$

HINTS & STEPS

Q1 Hint: Co-prime numbers are pairs of numbers that do not share any common factor other than 1.

Answer: (c) 1

Q2. Solution & Steps

Hint: The square root of a negative real number is imaginary ($4i$) and is not part of the real number system.

Answer: (d) None of these

Steps:

$$\sqrt{-16} = \sqrt{16} \times \sqrt{-1} = 4i. (i = \sqrt{-1})$$

The real number system consists solely of rational and irrational numbers.

Since $4i$ is a complex/imaginary number, it is neither rational nor irrational.

Thus, choice (d) is correct.

Q3. Solution & Steps

Hint: Use the formula: $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$.

Answer: (d) 207

Steps:

$$\text{HCF}(161, p) \times \text{LCM}(161, p) = 161 \times p$$

$$23 \times 1449 = 161 \times p$$

$$p = (23 \times 1449) / 161 = 1449 / 7 = 207.$$

Q4. Solution & Steps

Hint: Expand using the algebraic identity $(a - b)^2 = a^2 - 2ab + b^2$.

Answer: (a) An irrational number

Q5. Solution & Steps

Hint: Find all positive common factors of 368 and 621.

Answer: 23

Steps:

$$\text{Prime factorization of } 368 = 2^4 \times 23 = 16 \times 23.$$

Prime factorization of $621 = 3^3 \times 23 = 27 \times 23$.

Q6. Solution & Steps

Hint: The bells toll together after a duration equal to the LCM of 4, 6, 8, and 10 seconds.

Answer: 10:02 a.m.

Steps:

$$4 = 2^2, 6 = 2 \times 3, 8 = 2^3, 10 = 2 \times 5.$$

$$\text{LCM}(4, 6, 8, 10) = 2^3 \times 3 \times 5 = 120 \text{ seconds.}$$

Q7. Solution & Steps

Hint: Write 32760 as a product of prime numbers.

Answer: 2

Steps:

$$\text{Complete prime factorization} = 2^3 \times 3^2 \times 5^1 \times 7^1 \times 13^1.$$

The power (exponent) of 3 is 2.

Q8. Solution & Steps

Hint: Use the identity $p^3 + q^3 = (p + q)(p^2 - pq + q^2)$. Since $(p^2 - pq + q^2)$ is a factor of $(p^3 + q^3)$, $\text{HCF} = p^2 - pq + q^2$.

Answer: Proved ($p = q$)

Steps:

$$\text{HCF}(p^3 + q^3, p^2 - pq + q^2) = p^2 - pq + q^2.$$

$$\text{Equating with given condition: } p^2 - pq + q^2 = pq.$$

<https://youtu.be/YyiwjzW5lxo> [video solution]

<https://mathsbasemaker.com/> [website address]

