

Question Bank

GRADE : 10

Subject: Math

Chapter : 1- Real Numbers

Course Faculty : Mrs. Rosemary .

1	Prime factorization of 424 is: a) $2^3 \times 53$ b) $2^4 \times 53$ c) $2 \times 53 \times 2$ d) $2 \times 53 \times 4$	CBSE (2023, 2024)	[1]
2	If two numbers do not have common factor (other than 1), then they are called a) co - prime numbers b) prime numbers c) twin primes d) composite numbers	CBSE(2020, 2022)	[1]
3	$2 - \sqrt{3}$ is a) an integer b) a whole number c) an irrational number d) a rational number	CBSE(2021, 2023)	[1]
4	Which of the followings is an irrational number? a) $(\sqrt{2} - 1)^2$ b) $(2\sqrt{3} - \frac{1}{\sqrt{3}})^2$ c) $\sqrt{2} - (2 + \sqrt{2})$	CBSE(2019, 2024)	[1]

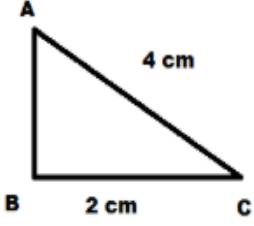
	d) $\frac{(\sqrt{2}+5\sqrt{2})}{\sqrt{2}}$	
5	<p>What is the largest number that divides 245 and 1029, leaving remainder 5 in each?</p> <p>CBSE(2020, 2022)</p> <p>a) 5 b) 16 c) 9 d) 15</p>	[1]
6	<p>If a is a non - zero rational and \sqrt{b} is irrational, then $a\sqrt{b}$ is: CBSE(2021)</p> <p>a) a natural number b) a rational number c) an integer d) an irrational number</p>	[1]
7	<p>According to the Fundamental Theorem of Arithmetic, if p (a prime number) divides b^2 and b is positive, then _____.</p> <p>CBSE(2018, 2020)</p> <p>a) p divides b b) b divides p c) p^2 divides b d) b^2 divides p</p>	[1]
8	<p>The product of two numbers is 1600 and their HCF is 5. The LCM of the numbers is</p> <p>CBSE(2019, 2023)</p> <p>a) 8000 b) 320 c) 1605 d) 1600</p>	[1]
9	<p>HCF of $(3^4 \times 2^2 \times 7^3)$ and $(3^2 \times 5 \times 7)$ is: CBSE(2020)</p> <p>a) 567 b) 63 c) 729</p>	[1]

	d) 630	
10	<p>If two positive integers a and b are expressible in the form $a = pq^2$ and $b = p^3 q$; p, q being prime numbers, then HCF (a, b) is</p> <p>CBSE(2022)</p> <p>a) $p^2 q^2$ b) $p^3 q^3$ c) pq d) $p^3 q^2$</p>	[1]
11	<p>The least positive integer divisible by 20 and 24 is</p> <p>CBSE(2019, 2021)</p> <p>a) 240 b) 360 c) 120 d) 480</p>	[1]
12	<p>If two positive integers m and n can be expressed as $m = x^2 y^5$ and $n = x^3 y^2$, where x and y are prime numbers, then HCF(m, n) =</p> <p>a) $x^3 y^2$ b) $x^2 y^2$ c) $x^3 y^3$ d) $x^2 y^3$</p>	[1]
13	<p>The multiplicative inverse of zero</p> <p>a) does not exist b) 0 c) $\frac{1}{0}$ d) 1</p>	[1]
14	<p>$\sqrt{2}$ is</p> <p>a) a rational number b) an irrational number c) a terminating decimal d) a non - terminating repeating decimal</p>	[1]

15	<p>$3 + 2\sqrt{5}$ is a/an:</p> <p>a) rational number</p> <p>b) natural Number</p> <p>c) irrational number</p> <p>d) integer</p>	CBSE(2022)	[1]
16	<p>Two tanks contain 504 and 735 litres of milk respectively. Find the maximum capacity of a container which can measure the milk of either tank in exact number of times.</p> <p>a) 21 litres</p> <p>b) 7 litres</p> <p>c) 6 liters</p> <p>d) 42 litres</p>		[1]
17	<p>HCF of two numbers is 113, their LCM is 56952. If one number is 904, the second number is</p> <p>a) 7119</p> <p>b) 7911</p> <p>c) 7719</p> <p>d) 7791</p>	CBSE(2020)	[1]
18	<p>If p and q are natural numbers and p is the multiple of q , then what is the HCF of p and q ?</p> <p>a) p</p> <p>b) p + q</p> <p>c) pq</p> <p>d) q</p>		[1]
19	<p>The prime factorization of the number 2304 is</p> <p>a) $2^7 \times 3^2$</p> <p>b) $2^8 \times 3^1$</p> <p>c) $2^7 \times 3^3$</p>	CBSE(2019, 2024)	[1]

	d) $2^8 \times 3^2$	
20	LCM (850, 500) is: a) $17 \times 5^3 \times 2$ b) $17 \times 5^2 \times 2^2$ c) 17×500 d) 850×50	CBSE (2022, 2023) [1]
21	Three bells ring at intervals of 6, 12 and 18 minutes. If all the three bells rang at 6 a.m., when will they ring together again?	[2]
22	Prove that $(5 - 3\sqrt{2})$ is an irrational number, given that $\sqrt{2}$ is irrational number.	[2]
23	Prove that $2\sqrt{3} - 1$ is an irrational number.	CBSE(2018–2024 (every year) [2]
24	Define HCF of two positive integers and find the HCF of the pair of numbers: 100 and 190.	[2]
25	The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 a.m., at what time will they change together next?	[2] CBSE Sample Paper pattern
26	Find the LCM and HCF of the pairs of integers 510 and 92 and verify that $\text{LCM} \times \text{HCF} = \text{product of the two numbers}$.	[2] CBSE (2019, 2022)
27	The HCF of two numbers is 23 and their LCM is 1449. If one of the numbers is 161, find the other.	[2]
28	Prove that $\frac{2-\sqrt{3}}{5}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.	[2]
29	Find the HCF of the following polynomials: $2x^4 - 2y^4$ and $3x^3 + 6x^2y - 3xy^2 - 6y^3$	CBSE(2018) [2]
30	Explain why $3 \times 5 \times 7 + 7$ is a composite number?	[2]
31	Find the greatest number which divides 85 and 72 leaving remainder 1 and 2 respectively.	[2] CBSE(2021)
32	Prove that $2 - 3\sqrt{5}$ is an irrational number.	[2]
33	There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?	[2]
34	Show that $5 - 2\sqrt{3}$ is an irrational number.	CBSE(2019–2024) [2]
35	Find pairs of natural numbers whose least common multiple is 78 and the greatest divisor is 13.	[2] NCERT Exemplar
36	Prove that $5 - \sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.	[3]

37	Find the LCM and HCF of 336 and 54 and verify that $\text{LCM} \times \text{HCF} = \text{product of two numbers}$. NCERT Exemplar	[3]
38	Show that $3\sqrt{2}$ is an irrational number.	[3]
39	What is the smallest number that, when divided by 35, 56 and 91 leaves remainders of 7 in each case? CBSE(2019, 2023)	[3]
40	Prove that $\sqrt{p} + \sqrt{q}$ is irrational, where p, q are primes.	[3]
41	On 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?	[3]
42	Prove that $7\sqrt{5}$ is irrational.	[3]
43	Define HCF of two positive integers and find the HCF of the pair of numbers: 475 and 495. CBSE(2021)	[3]
44	Amita, Suneha and Raghav start preparing cards for greeting each person of an old age home on new year. In order to complete one card, they take 10, 16 and 20 minutes respectively. If all of them started together, after what time will they start preparing a new card together? Why do you think there is a need to show elders that the young generation cares for them and remembers the contribution made by them in the prime of their life? CBSE Value-based (Sample Paper)	[3]
45	Find the values of a and b so that the polynomials P(x) and Q(x) have $(x^2 - x - 12)$ as their HCF, where $P(x) = (x^2 - 5x + 4)(x^2 + 5x + a)$ $Q(x) = (x^2 + 5x + 6)(x^2 - 5x - 2b)$	[3]
46	Ankit is printing orange and green forms. He notices that 3 orange forms fit on a page, and 5 green forms fit on a page. If Ankit wants to print the exact same number of orange and green forms, what is the minimum number of each form that he could print? CBSE (2022–2024)	[3]
47	Mrs. Gupta arranged some snacks for her child's birthday party. After the guest left she had some food left over. She did not want to waste food and so she contacted a local NGO. She gave 60 pieces of pastries, 168 pieces of cookies, and 330 chocolate bars to the team. Now the NGO workers want to make the maximum number of packets with those foods so that no food is left for distributing to the beggars at the roadside. Find the greatest number of packets that they can make.	[3]
48	Prove that $6 + \sqrt{2}$ is irrational.	[3]
49	In a seminar, the number of participants in Hindi, English and Mathematics are 60, 84 and 108, respectively. Find the minimum number of rooms required if in each room the same number of participants is to be seated and all of them being in the same subject.	[3]

50	The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they all change simultaneously at 8 a.m. then at what time will they again change simultaneously?	[3]
51	Show that $(4 + 3\sqrt{2})$ is irrational.	[5]
52	Let a and b be positive integers. Show that $\sqrt{2}$ always lies between $\frac{a}{b}$ and $\frac{a+2b}{a+b}$.	[5]
53	Prove that $\frac{2\sqrt{3}}{5}$ is irrational.	[5]
54	Prove that the area of $\triangle ABC$ is irrational – repeated)	CBSE Board (Proof-based) [5]
		
55	Prove that for any prime positive integer $\sqrt{p} + \sqrt{q}$ is an irrational number.	[5]
56	On dividing the polynomial $4x^4 - 5x^3 - 39x^2 - 46x - 2$ by the polynomial $g(x)$, the quotient is $x^2 - 3x - 5$ and the remainder is $-5x + 8$. Find the polynomial $g(x)$.	[5]
57	Three sets of physics, chemistry and mathematics books have to be stacked in such a way that all the books are stored topic wise and the number of books in each stack is the same. The number of physics books is 192, the number of chemistry books is 240 and the number of mathematics books is 168. Determine the number of stacks of physics, chemistry and mathematics books.	[5]
58	Find the HCF of 963 and 657 and express it as a linear combination of them.	[5]
59	If the HCF of 152 and 272 is expressible in the form $272 \times 8 + 152x$, then find x.	[5]
60	Prove that $\sqrt[3]{6}$ is an irrational number.	[5]
61	If the HCF of 210 and 55 is expressible in the form $210 \times 5 + 55y$, find y.	[5]
62	Show that $(4 + 3\sqrt{2})$ is irrational number.	[5]
63	In a seminar the number of participants in Mathematics, Physics and Biology are 336, 240 and 96. Find the minimum number of rooms required if in each room same number of participants is to be seated and all of them being in the same subject. CBSE (2021, 2023)	[5]
64	State Fundamental theorem of Arithmetic. Find LCM of numbers 2520 and 10530 by prime factorization method.	[5]
65	Find the LCM of 2.5, 0.5 and 0.175. CBSE (2024)	[5]
66	Read the following text carefully and answer the questions that follow:	[4]

A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



1. What is the maximum number of participants that can be accommodated in each room if there are multiple rooms, and in each room, the same number of participants is to be seated, and all of them are in the same subject? (1)
2. What is the minimum number of rooms required during the event? (1)
3. Show that the product of two numbers 60 and 84 is equal to the product of their HCF and LCM. (2)

OR

What is the LCM of two numbers if their product is 1080 and their HCF is 30? (2)

67 **Read the following text carefully and answer the questions that follow:**

[4]

To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections - section A and section B of grade X. There are 32 students in section A and 36 students in section B.



1. What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B? (1)
2. If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32, 36) is (1)
3. $7 \times 11 \times 13 \times 15 + 15$ is a (2)

OR

If p and q are positive integers such that $p = ab^2$ and $q = a^2b$, where a, b are prime numbers, then the LCM (p, q) is (2)

68 **Read the following text carefully and answer the questions that follow:**

[4]

Teaching Mathematics through activities is a powerful approach that enhances students' understanding and engagement. Keeping this in mind, Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student got 173250.

Now, Mukta asked some questions as given below to the students:

1. What is the least prime number used by students? **(1)**

2. a. How many students are in the class? **(2)**

OR

b. What is the highest prime number used by students? **(2)**

3. Which prime number has been used maximum times? **(1)**

69 Richa is an artificial jewellery seller. She buys them from a dealer at a price based on the presence or absence of stones as shown in the table below.

[4]

Item	With stones	Without stones
Ring	110	70
Earring pair	170	90
Bangle pair	90	120

b. For every ring with stones, two rings without stones are purchased by Richa's customers. Richa buys rings accordingly from the dealer for ₹ 10000. How many rings does she buy?

c. In her next visit to the dealer, Richa finds that dealer has increased the price of rings with stones by ₹ 10. Richa still wants to spend ₹ 10000 on rings. What is the reduction in the number of rings she buys?

a. 10

b. 20

c. 40

d. 50

d. The dealer increases the price of one type of earrings. Richa buys earrings (with stones and without stones) in the ratio of 5: 9 before the price hike. After the price hike, she buys earrings in the ratio of 8 :13 with the same amount of money. Does she buy more earrings with stones than earrings without stones after the price hike? Give reasons.

e. Richa purchases 37 pairs of bangles with stones and 33 pairs of bangles without stones. She divides them into two sets. Set 1 contains 40 pairs of bangles, and set 2 contains 30 pairs of bangles. What is the difference between the number of bangle pairs with stones in set 1 and the number of bangle pairs without stones in set 2?

	<p>a. 4 b. 7 c. 10 d. 30</p> <p>f. Despite the price hike by the dealer, Richa increases the number of jewellery with stones she purchases for her customers. What could be the reason for her decision?</p>	
70	<p>Assertion (A): H.C.F. of 12 and 77 is 1. CBSE (2022)</p> <p>Reason (R): L.C.M. of two coprime numbers is equal to their product.</p> <p>a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.</p>	[1]
71	<p>Assertion (A): For any two positive integers a and b, $HCF(a, b) \times LCM(a, b) = a \times b$</p> <p>Reason (R): The HCF of the two numbers is 8 and their product is 280. Then their LCM is 40.</p> <p>a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.</p>	[1]
72	<p>Assertion (A): H.C.F. of smallest prime and smallest composite is 2.</p> <p>Reason (R): Smallest prime is 2 and smallest composite is 4 so their H.C.F. is 2.</p> <p>a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.</p>	[1]
73	<p>Assertion (A): The H.C.F. of two numbers is 16 and their product is 3072. Then their L.C.M.= 162 CBSE (2020)</p> <p>Reason: If a, bare two positive integers, then $H.C.F. \times L.C.M. = a \times b$</p> <p>a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.</p>	[1]

	c) A is true but R is false. d) A is false but R is true.	
74	<p>Assertion (A): The HCF of two numbers is 18 and their product is 3072. Then their LCM = 169.</p> <p>Reason (R): If a, b are two positive integers, then $HCF \times LCM = a \times b$.</p> <p>a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.</p>	[1]