



MATHS

BOOKS - CHHAYA PUBLICATION MATHS (BENGALI ENGLISH)

REAL NUMBERS

Illustrative Examples

1. Prove that, $\sqrt{3}$ is not rational.

2. Show that the sum of a rational number and

an irrational number cannot be rational.

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3. Prove that, $\left(\sqrt{3}-\sqrt{5} ight)$ is an irrational

number.

4. Prove that, $\log_3 6$ is an irrational number.



6. Prove that the number square root of a positive integer which is not a square number,



9. Express $-2 \leq x \leq 7$ in modulus notation. Watch Video Solution **10.** If x is real, show the geometrical representation of |x + 1| < 4. Watch Video Solution **11.** If x is real, show the geometrical representation of $|x - 1| \ge 2$.

12. Prove that the square of an odd natural number when divided by 8 always gives the remainder 1.

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Exercise Multiple Choice Questions

1. Both π and e are called -

- A. rational number
- B. irrational number
- C. real number
- D. imaginary number

Answer: B

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2. A number expressed as a non-terminating

recurring decimal is always-

- A. rational number
- B. irrational number
- C. real number
- D. imaginary number

Answer: A



3. The system of numbers obtained by combining the sets of rational and irrational numbers is called the set of -

- A. rational number
- B. irrational numbers
- C. real numbers
- D. imaginary numbers

Answer: C

4.
$$|x-2|=2-x$$
 when-

A.
$$x \leq -2$$

 $\mathsf{B.}\,x\leq 2$

$$\mathsf{C}.\,x\geq\,-2$$

D. $x \geq 2$

Answer: B

5. If
$$|x| \geq y$$
 then either $x \geq y$ or -

A.
$$x \leq -y$$

$$\mathsf{B}.\,x\leq y$$

$$\mathsf{C}.\,x\,\geq\,-\,y$$

 $\mathsf{D}.\,x\geq y$

Answer: A



6. If
$$|x| \leq y$$
 then -

A.
$$-y < x < y$$

 $\mathsf{B.} - y \leq x < y$

 $\mathsf{C}.-y < x \leq y$

$$\mathsf{D}.-y \leq x \leq y$$

Answer: D

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7. State which of the following is the solution of $|x-2| \ge 5$ -

- A. $x \geq 7$
- $\mathsf{B.}\,x\,\leq\,-3$

C. $x \geq 7$ or $x \leq -3$

D.
$$-3 \leq x \leq 7$$

Answer: C

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8. State which of the following is the solution of |x+1| < 4 -

A.
$$x < \, -5$$

 $\mathsf{B.}\,x>3$

C. $x < \, -5 \, {
m or} \, x > 3$

D.
$$-5 < x < 3$$

Answer: D

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Exercise Very Short Answer Type Questions

1. Prove that the product of two consecutive

natural numbers is even.

2. If m is an even integer, show that m^2 is also

an even integer.

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3. If n is an odd integer, prove that n^2 is also

an odd integer.

4. If $x\sqrt{2} + y\sqrt{3} = 0$ where x and y are

rational numbers, show that x = y = 0.





6. Give the definition of absolute value of a

real number and find the absolute values of :

$$3\pi - 10\left(\pi = rac{22}{7}
ight)$$



7. Give the definition of absolute value of a real

number and find the absolute values of :

$$6-5\sqrt{2}$$





11. Solve :
$$|1 - x| - x = 0$$



13. Show geomatrical representations of the following inequalities :



Exercise Short Answer Type Questions

1. Prove that the square of an odd integer can be expressed in the form 8p + 1 where p = 0 or a positive integer.



2. Prove that product of any r consecutive

natural numbers is always divisible by r!



3. Prove that the following numbers are irrational : $\sqrt{3} + \sqrt{2}$

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4. Prove that the following numbers are irrational :

 $\log_3 4$

5. Remove the modulus notations in each of

the following cases :

|x+1| < 2

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6. Remove the modulus notations in each of

the following cases :

 $|x-2|\geq 3$

7. Remove the modulus notations in each of

the following cases :

$$0 < |x-2| \leq 5$$

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8. Solve :
$$|2x - 1| > 3$$

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9. Solve :
$$|x-4| \leq 5$$

10. Solve :
$$rac{1}{|3-2x|} \leq rac{1}{5} igg(x
eq rac{3}{2}igg)$$

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11. Solve :
$$\left|x^2-1
ight|\leq 8$$

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Exercise Long Answer Type Questions

1. Define a rational number and prove that $\sqrt{2}$

is not rational.

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2. Define an irrational number and show that

 $\sqrt{5}$ is an irrational number.

3. Define a real number and state its important

properties.



4. If a is rational and b is irrational, show that :

a+b



5. If a is rational and b is irrational, show that :

a - b



6. If a is rational and b is irrational, show that :

$$\displaystyle rac{a}{b}[a
eq 0]$$
 cannot be rational.





8. Give equivalent statements in terms of modulus notations :

x>2 and $x<\ -2$

9. Give equivalent statements in terms of modulus notations :

$$-2 \leq x-3 \leq 8$$

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10. Give equivalent statements in terms of modulus notations :

x>8 and $x<\ -2$