MATHS

NCERT - NCERT Maths(KANNADA)

REAL NUMBERS

Example

1. Show that every positive even integer is of the form 2q, and that every positive odd integer is of the form 2q + 1, where q is some integer.

Watch Video Solution

2. Show that every positive odd integer is of the form 4q + 1 or 4q + 3, where q is some integer.

Watch Video Solution

3. Consider the numbers of the form 4^n where n is a natural number. Check whether there is any value of n for which 4^n ends with zero?

Watch Video Solution

4. Find the HCF and LCM of 12 and 18 by the prime factorization method.

Watch Video Solution

5. Using the above theorems, without actual division, state whether decimal form of the following rational numbers are terminating or non-terminating, repeating decimals.

(i) $\frac{6}{125}$ (ii) $\frac{25}{32}$ (iii) $\frac{100}{81}$ (iv) $\frac{41}{75}$

Watch Video Solution

6. Write the decimal form of the following rational numbers without actual division.

(i) $\frac{35}{50}$ (ii) $\frac{21}{25}$ (iii) $\frac{7}{8}$

Watch Video Solution

7. Show that $\sqrt{2}$ is irrational.

Watch Video Solution

8. Show that $5 - \sqrt{3}$ is irrational.

Watch Video Solution

9. Show that $3\sqrt{2}$ is irrational.

Watch Video Solution

10. Prove that $\sqrt{2}+\sqrt{2}$ is irrational .

Watch Video Solution

11. Expand $\log \frac{343}{125}$

Watch Video Solution

12. Write 2log3+ 3log5 - 5log2 as a single logarithm.

Watch Video Solution

13. Solve $3^x = 5^{x-2}$

Watch Video Solution

14. Find x if $2\log 5 + \frac{1}{2}\log 9 - \log 3 = \log x$

Watch Video Solution

Do This

1. Find q and r for the following pairs of positive integers a and b, satisfying a = bq + r.

$a = 13, b = 3$

Watch Video Solution

2. Find q and r for the following pairs of positive integers a and b, satisfying a = bq + r.

$a = 80, b = 8$

Watch Video Solution

3. Find q and r for the following pairs of positive integers a and b, satisfying a = bq + r.

$a = 125, b = 5$

Watch Video Solution

4. Find q and r for the following pairs of positive integers a and b, satisfying a = bq + r.

$a = 132, b = 11$

Watch Video Solution

5. Find the HCF of the following by using Euclid algorithm.

50 and 70

Watch Video Solution

6. Find the HCF of the following by using Euclid algorithm.

96 and 72

Watch Video Solution

7. Find the HCF of the following by using Euclid algorithm.

$300 \text{ and } 550$

Watch Video Solution

8. Find the HCF of the following by using Euclid algorithm.

$1860 \text{ and } 2015$

Watch Video Solution

9. Express 2310 as a product of prime factors.

10. Find the HCF and LCM of the following given pairs of numbers by prime factorisation method .

120,90

11. Find the HCF and LCM of the following given pairs of numbers by prime factorisation method .

50,60

Watch Video Solution

12. Find the HCF and LCM of the following given pairs of numbers by prime factorisation method .

37,49

Watch Video Solution

13. Write the following terminating decimals in the form of $\frac{p}{q}, \neq 0$ and p,q are co primes

15.265

Write the denominators in $2^n 5^m$ form

Watch Video Solution

14. Write the following terminating decimals in the form of $\frac{p}{q}, \neq 0$ and p,q are co primes

0.1255

Write the denominators in $2^n 5^m$ form

Watch Video Solution

15. Write the following terminating decimals in the form of $\frac{p}{q}, \neq 0$ and p,q are co primes

0.4

Write the denominators in $2^n 5^m$ form

Watch Video Solution

16. Write the following terminating decimals in the form of $\frac{p}{q}, \neq 0$ and p,q are co primes

23.34

Write the denominators in $2^n 5^m$ form

Watch Video Solution

17. Write the following terminating decimals in the form of $\frac{p}{q}, \neq 0$ and p,q are co primes

1215.8

Write the denominators in $2^n 5^m$ form

Watch Video Solution

18. Write the denominator of the following rational numbers in $2^n 5^m$ form where n and m are non-negative integers and then write them in their decimal form

$\frac{3}{4}$

Watch Video Solution

Watch Video Solution

19. Write the denominator of the following rational numbers in $2^n 5^m$ form where n and m are non-negative integers and then write them in their decimal form

$$\frac{7}{25}$$

Watch Video Solution

20. Write the denominator of the following rational numbers in $2^n 5^m$ form where n and m are non-negative integers and then write them in their

decimal form

$\frac{51}{64}$

Watch Video Solution

21. Write the denominator of the following rational numbers in $2^n 5^m$ form where n and m are non-negative integers and then write them in their decimal form

$\frac{14}{25}$

Watch Video Solution

22. Write the denominator of the following rational numbers in $2^n 5^m$ form where n and m are non-negative integers and then write them in their decimal form

$$\frac{80}{100}$$

Watch Video Solution

23. Write the following rational numbers in the decimal form and find out the block of repeating digits in the quotient.

$$\frac{1}{3}$$

Watch Video Solution

Watch Video Solution

24. Write the following rational numbers in the decimal form and find out the block of repeating digits in the quotient.

$\frac{2}{7}$

Watch Video Solution

25. Write the following rational numbers in the decimal form and find out the block of repeating digits in the quotient.

$\frac{5}{11}$

Watch Video Solution

26. Write the following rational numbers in the decimal form and find out the block of repeating digits in the quotient.

$\frac{10}{13}$

Watch Video Solution

27. Evaluate

2^1

Watch Video Solution

28. Evaluate

$(4.73)^0$

Watch Video Solution

29. Evaluate

0^3

Watch Video Solution

30. Evaluate

$(-1)^4$

Watch Video Solution

31. Evaluate

$(0.25)^{-1}$

Watch Video Solution

32. Evaluate

$\left(\frac{5}{4}\right)^{2}$

Watch Video Solution

33. Evaluate

$$\left(1\frac{1}{4}\right)^2$$

Watch Video Solution

34. (a) Express 10, 100, 1000, 10000, is exponential form

(b) Express in simplest exponential form

(i) 16×64 (ii) 25×125 (iii) $128 \div 32$

Watch Video Solution

35. Write the following in logarithmic form.

$7 = 2^x$

Watch Video Solution

36. Write the following in logarithmic form.

$10 = 5^b$

Watch Video Solution

37. Write the following in logarithmic form.

$\frac{1}{81} = 3^c$

Watch Video Solution

38. Write the following in logarithmic form.

$100 = 10^z$

Watch Video Solution

39. Write the following in logarithmic form.

$\frac{1}{257} = 4^a$

Watch Video Solution

40. Write the following in exponential form.

$\log_{10} 100 = 2$

Watch Video Solution

41. Write the following in exponential form.

$\log_5 25 = 2$

Watch Video Solution

42. Write the following in exponential form.

$\log_2 2 = 1$

Watch Video Solution

43. Express the logarithms of the following as the sum of the logarithm

35×46

Watch Video Solution

44. Express the logarithms of the following as the sum of the logarithm

235×437

Watch Video Solution

45. Express the logarithms of the following as the sum of the logarithm

2437×3568

Watch Video Solution

46. Express the logarithms of the following as the difference of logarithms

$\frac{23}{34}$

Watch Video Solution

47. Express the logarithms of the following as the difference of logarithms

$$\frac{373}{275}$$

Watch Video Solution

48. Express the logarithms of the following as the difference of logarithms

$4325 \div 3734$

Watch Video Solution

49. Express the logarithms of the following as the difference of logarithms

$5055 \div 3303$

Watch Video Solution

50. Using $\log_a x^n = n \log_a x,$ expand the following

$\log_2 7^{25}$

Note : $\log x = \log_{10} x$

Watch Video Solution

51. Using $\log_a x^n = n \log_a x,$ expand the following

$\log_5 8^{50}$

Note: $\log x = \log_{10} x$

Watch Video Solution

52. Using $\log_a x^n = n \log_a x,$ expand the following

$\log 5^{23}$

Note: $\log x = \log_{10} x$

Watch Video Solution

53. Using $\log_a x^n = n \log_a x,$ expand the following

$\log 1024$

Note: $\log x = \log_{10} x$

Watch Video Solution

Think And Discuss

1. Can you find the HCF of 1.2 and 0.12? Justify your answer.

Watch Video Solution

2. If r = 0, then what is the relationship between a, b and q in a = bq + r ?

Watch Video Solution

3. Does $\log_2 0$ exist ? Give reason .

Watch Video Solution

4. Prove

$\log_b b = 1$

Watch Video Solution

5. Prove

$\log_b 1 = 0$

Watch Video Solution

6. Prove

$\log_x b^x = x$

Watch Video Solution

7. Prove the quotient rule using $\frac{a^m}{a^n} = a^{m-n}$

Watch Video Solution

8. We can write $\log \frac{x}{y} = \log\left(x.\, y^{-1}\right)$ Can you prove that $\log \frac{x}{y} = \log x - \log y$ using product and power rules.

Watch Video Solution

9. We know that, if $7 = 2^x$ then $x = \log_2 7$. Then, what is the value of $2^{\log_2 7}$? Justify your answer. Generalise the above by taking some more examples for $a^{\log_a N}$

Watch Video Solution

Try This

1. Show that $3^n \times 4^m$ cannot end with the digit 0 or 5 for any natural numbers ‘n’and 'm'

Watch Video Solution

2. Solve the following

$\log_2 32 = x$

Watch Video Solution

3. Solve the following

$\log_5 625 = y$

Watch Video Solution

4. Solve the following

$\log_{10} 10000 = z$

Watch Video Solution

5. Solve the following

$\log_x 16 = 2 \therefore x^2 = 16 \Rightarrow x = \pm 4,$ Is is correct

or not ?

Watch Video Solution

6. We know that $\log_{10} 100000 = 5$

Show that you get the same answer by writing $100000 = 1000 \times 100$ and then using the product rule. Verify the answer.

Watch Video Solution

7. We know $\log_2 32 = 5$. Show that we get the same answer by writing 32 as $\frac{64}{2}$ and then using

the product rule. Verify your answer .

Watch Video Solution

8. We have $\log_2 32 = 5$. Show that we get the same result by writing $32 = 2^5$ and then using power rules. Verify the answer.

Watch Video Solution

9. Find the value of $\log_2 32$

Watch Video Solution

10. Find the value of $\log_c \sqrt{c}$

Watch Video Solution

11. Find the value of $\log_{10} 0.001$

Watch Video Solution

12. Find the value of $\log_{\frac{2}{3}} \frac{8}{27}$

Watch Video Solution

Exercise 1 1

1. Use Euclid's algorithm to find the HCF of

900 and 270

Watch Video Solution

2. Use Euclid's algorithm to find the HCF of

196 and 38220

Watch Video Solution

3. Use Euclid's algorithm to find the HCF of

1651 and 2032

Watch Video Solution

4. Use division algorithm to show that any positive odd integer is of the form 6q + 1, or 6q + 3 or 6q + 5, where q is some integer

Watch Video Solution

5. Use division algorithm to show that the square of any positive integer is of the form 3p or 3p + 1.

Watch Video Solution

6. Use division algorithm to show that the cube of any positive integer is of the form 9 m, 9m + 1 or 9m + 8.

Watch Video Solution

7. Show that one and only one out of n, n + 2 or n + 4 is divisible by 3, where n is any positive integer.

Watch Video Solution

Exercise 1 2

1. Express each of the following numbers as a product of its prime factors.

140

Watch Video Solution

2. Express each of the following numbers as a product of its prime factors.

156

Watch Video Solution

3. Express each of the following numbers as a product of its prime factors.

3825

Watch Video Solution

4. Express each of the following numbers as a product of its prime factors.

5005

Watch Video Solution

5. Express each of the following numbers as a product of its prime factors.

7429

Watch Video Solution

6. Find the LCM and HCF of the following integers by the prime factorization method.

12,15 and 21

 Watch Video Solution

7. Find the LCM and HCF of the following integers by the prime factorization method.

17, 23 and 29

 Watch Video Solution

8. Find the LCM and HCF of the following integers by the prime factorization method.

8,9 and 25

 Watch Video Solution

9. Find the LCM and HCF of the following integers by the prime factorization method.

72 and 108

 Watch Video Solution

10. Find the LCM and HCF of the following integers by the prime factorization method.

306 and 657

Watch Video Solution

11. Check whether 6^n can end with the digit 0 for any natural number n.

Watch Video Solution

12. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers.

Watch Video Solution

13. How will you show that $(17 \times 11 \times 2) + (17 \times 11 \times 5)$ is a composite number? Explain.

Watch Video Solution

14. What is the last digit of 6^{100} .

Watch Video Solution

Exercise 1 3

1. Write the following rational numbers in their decimal form and also state which are terminating and which are non-terminating, repeating decimal.

$\frac{3}{8}$

Watch Video Solution

2. Write the following rational numbers in their decimal form and also state which are terminating and which are non-terminating, repeating decimal.

$\frac{229}{400}$

Watch Video Solution

3. Write the following rational numbers in their decimal form and also state which are terminating and which are non-terminating, repeating decimal.

$4\frac{1}{5}$

Watch Video Solution

4. Write the following rational numbers in their decimal form and also state which are terminating and which are non-terminating, repeating decimal.

$\frac{2}{11}$

Watch Video Solution

5. Write the following rational numbers in their decimal form and also state which are terminating and which are non-terminating, repeating decimal.

$\frac{8}{125}$

Watch Video Solution

6. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{13}{3125}$$

Watch Video Solution

7. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{11}{12}$$

Watch Video Solution

8. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{64}{455}$$

Watch Video Solution

9. Without performing division, state whether the following rational numbers will have a terminating

decimal form or a non-terminating, repeating decimal form.

$$\frac{15}{1600}$$

Watch Video Solution

10. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{29}{343}$$

Watch Video Solution

11. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{23}{2^3.5^2}$$

Watch Video Solution

12. Without actually performing the long division state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion

$$\frac{129}{2^2 5^7 7^5}$$

Watch Video Solution

13. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating decimal form.

$$\frac{9}{15}$$

Watch Video Solution

14. Without performing division, state whether the following rational numbers will have a terminating decimal form or a non-terminating, repeating

decimal form.

$$\frac{36}{100}$$

Watch Video Solution

15. Without actually performing the long division state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion

$$\frac{77}{210}$$

Watch Video Solution

16. Write the following rationals in decimal form using

$$\frac{13}{25}$$

Watch Video Solution

17. Write the following rationals in decimal form using

$$\frac{15}{16}$$

Watch Video Solution

18. Write the following rationals in decimal form using

$$\frac{23}{2^3.5^2}$$

Watch Video Solution

19. Write the following rationals in decimal form using

$$\frac{7218}{3^3.5^2}$$

Watch Video Solution

20. Write the following rationals in decimal form using

$\frac{143}{110}$

Watch Video Solution

21. Express the following decimals in the form of $\frac{p}{q}$, and write the prime factors of q. What do you observe?

4.123

Watch Video Solution

22. Express the following decimals in the form of $\frac{p}{q}$, and write the prime factors of q. What do you observe?

0.1201201

Watch Video Solution

23. Express the following decimals in the form of $\frac{p}{q}$, and write the prime factors of q. What do you observe?

$43.\ \overline{12}$

Watch Video Solution

24. Express the following decimals in the form of $\frac{p}{q}$, and write the prime factors of q. What do you observe?

$0.\overline{63}$

Watch Video Solution

Exercise 1 4

1. Prove that the following are irrationals :

$\frac{1}{\sqrt{2}}$

Watch Video Solution

2. Prove that the following are irrational.

$\sqrt{3}+\sqrt{5}$

Watch Video Solution

3. Prove that the following are irrational.

$6+\sqrt{2}$

Watch Video Solution

4. Prove that the following are irrational.

$\sqrt{5}$

Watch Video Solution

5. Prove that the following are irrational.

$3 + 2\sqrt{5}$

Watch Video Solution

6. Prove that $\sqrt{p} + \sqrt{q}$ is an irrational, where p,q are primes.

Watch Video Solution

Exercise 1 5

1. Determine the value of the following.

$\log_{25} 5$

Watch Video Solution

2. Determine the value of the following.

$\log_{81} 3$

Watch Video Solution

3. Determine the value of the following.

$\log_2 \left(\frac{1}{16} \right)$

Watch Video Solution

4. Determine the value of the following.

$\log_7 1$

Watch Video Solution

5. Determine the value of the following.

$\log_x \sqrt{x}$

Watch Video Solution

6. Determine the value of the following.

$\log_2 512$

Watch Video Solution

7. Determine the value of the following.

$\log_{10} .0.01$

Watch Video Solution

8. Determine the value of the following.

$\log_{\frac{2}{3}} \left(\frac{8}{27} \right)$

Watch Video Solution

9. Determine the value of the following.

$2^{2+\log_2 3}$

Watch Video Solution

10. Write the following expressions as log N and find their values.

log 2 + log 5

Watch Video Solution

11. Write the following expressions as log N and find their values.

$\log_2 16 - \log_2 2$

Watch Video Solution

12. Write the following expressions as log N and find their values.

$3 \log_{64} 4$

Watch Video Solution

13. Write the following expressions as log N and find their values.

2 log 3 - 3 log 2

Watch Video Solution

14. Write the following expressions as log N and find their values.

log 10 + 2 log 3 - log 2

Watch Video Solution

15. Evaluate each of the following in terms of x and y, if it is given that $x = \log_2 3$ and $y = \log_2 5$

$\log_2 15$

Watch Video Solution

16. Evaluate each of the following in terms of x and y, if it is given that $x = \log_2 3$ and $y = \log_2 5$

$\log_2 7.5$

Watch Video Solution

17. Evaluate each of the following in terms of x and y, if it is given that $x = \log_2 3$ and $y = \log_2 5$

$\log_2 60$

Watch Video Solution

18. Evaluate each of the following in terms of x and y, if it is given that $x = \log_2 3$ and $y = \log_2 5$

$\log_2 6750$

Watch Video Solution

19. Expand the following.

$\log 1000$

Watch Video Solution

20. Expand the following.

$\log\left(\frac{128}{625}\right)$

Watch Video Solution

21. Expand the following.

$\log x^2 y^3 z^4$

Watch Video Solution

22. Expand the following.

$$\log\left(\frac{p^2q^3}{r^4}\right)$$

Watch Video Solution

23. Expand the following.

$$\log\sqrt{\frac{x^3}{y^2}}$$

Watch Video Solution

24. f $x^2 + y^2 = 25xy$, then prove that 2 log(x + y) = 3log3 + logx + logy.

Watch Video Solution

25. If $\log\left(\frac{x+y}{3}\right) = \frac{1}{2}(\log x + \log y)$ then find the value of $\frac{x}{y} + \frac{y}{x}$

Watch Video Solution

26. If $(2.3)^x = (0.23)^y = 1000$, then find the value of $\frac{1}{x} - \frac{1}{y}$

Watch Video Solution

27. If $2^{x+1} = 3^{1-x}$ then find the value of x.

Watch Video Solution

28. Is (i) log 2 rational or irrational? Justify your answer.

(ii) log 100 rational or irrational? Justify your answer.

Watch Video Solution

Optional Exercise

1. Can the number 6^n, n being a natural number, end with the digit 5? Give reason.

Watch Video Solution

2. Is $7 \times 5 \times 3 \times 2 + 3$ a composite number? Justify your answer.

Watch Video Solution

3. Prove that $\left(2\sqrt{3}+\sqrt{5}\right)$ is an irrational number. Also check whether $\left(2\sqrt{3}+\sqrt{5}\right)\left(2\sqrt{3}-\sqrt{5}\right)$ is rational or irrational.

Watch Video Solution

4. If $x^2+y^2=6xy$, prove that 2 log (x + y) = logx + logy + 3 log 2

Watch Video Solution

5. Find the number of digits in 4^{2013}, if $\log_{10} 2 = 0.3010$.

Watch Video Solution