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What is number and number system

Real numbers can be both positive or negative which can be denoted as \(‘R’\). Follow the steps given below: Step 1: We need to convert the Octal number to Binary first. What is the total number of parrots and goats?A.20B.25C.30D.35 Solution:- According to the question,Number of four legs = legs/2 – head= 90/2 – 35= 45 – 35= 10Number of two legs = Head – Number of four legs= 35 – 10= 25Ans. Step 3: Convert each digit into an equivalent group of four binary digits. Here, the place value is termed from right to left as first place value called units, second to the left as Tens, so on Hundreds, Thousands, etc. What is an Octal Number System?Ans: A Number system that has a base of 8 and uses numbers from 0 to 7 is called an Octal Number System. Step 3: The third group of the next two digits on the left of the group of thousands form the group of lakhs which is split up into lakhs and ten lakhs. The symbol \(I\) can be subtracted from \(V\) and \(X\) only. 11,440 Q.21 What is the sum of squares of all natural numbers from 1 to 10?A. 2890D. The ones, in turn, are divided into hundreds, tens and units. Example :- -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5.....infinite There are three types of integer numbers. Otherwise, it is a composite number. Formula Based on Numbers Sum of natural numbers = (first number + last number / 2) × n N = (last number – first number / class interval) + 1 Sum of squares of first n natural numbers = n(n+1)(2n+1)/6 Sum of cubes of first n natural numbers = [n(n+1)/2]² Division Formulas Dividend = (Divisor × Quotient) + Remainder Dividend – Remainder = Divisor × Quotient Dividend – remainder / quotient = divisor Formula Based on Number of Animals Number of four legs = (legs / 2) – head Number of two legs = Head – Number of four legs Important Point Based on Unit Digit If there is 0 at the unit’s place, then the unit’s digit will be 0. It uses 16 digits for the creation of its numbers. 720B. If there is 1 at the unit’s place, then the unit’s digit will be 1. Hence, to convert a hexadecimal number to a binary number, the base of that number is to be changed. The caste value of 6 is 6. 210 Q.2 1 + 2 + 3 + 4 ..... 78 + 79 + 80 = ?A. 8 Solution:- According to the question,unit digit= 3 × 2 × 3 × 9 × 9= 18 × 81= 8 × 1The unit digit will be 8.Ans. Hence, to convert the binary number into Hex number, the base of that number is to be changed. 3,250 Solution:- According to the question,2 + 4 + 6 +.....+ 104 + 106 + 108N = (last number – first number)/2 + 1N = (108 – 2)/2 + 1N = 106/2 + 1N = 53 + 1N = 54Sum = (first number + last number)/2 × nSum = (2 + 108)/2 × 54Sum = 110/2 × 54Sum = 55 × 54sum = 2,970Ans. Octal to Decimal Conversion Octal numbers are represented in base 8, but the decimal numbers are of base 10. For example, 10264 has place values as, (1 × 104) + (0 × 103) + (2 × 102) + (6 × 101) + (4 × 100) = 1 × 10000 + 0 × 1000 + 2 × 100 + 6 × 10 + 4 × 1 = 10000 + 0 + 200 + 60 + 4 = 10264 Binary Number System Number System with base value 2 is termed as Binary number system. 520D. Step 2: Add the result of this multiplication and the decimal number will be formed. Conversion from Hexadecimal to Other Number Systems Hex Numbers are represented with digits 0-9 and with letters A-F and with base 16. \(2, 3; 3, 4; 5, 6; , 8, 13; 12, 23\) etc. are natural numbers. How do you study the number system?Ans: A number system is a way to represent numbers. So tell which is the largest even number?A.10B.20C.15D.30 Solution:- According to the question,Sum of five consecutive even numbers 80= 80/5= 16Five consecutive even numbers – 12, 14, 16, 18, 20Largest even number = 20Ans. 2,872D. 2480C. 1179 Solution:- According to the question,23 + 25 + 27 + 29 + ...+ 67 + 68 + 71first number = 23last number = 71N = (last number – first number)/class interval + 1N = (71 – 23)/2 + 1N = 48/2 + 1N = 24 + 1N = 25Sum of natural numbers = (first number + last number)/2 × nSum = (23 + 71)/2 × 25Sum = 94/2 × 25Sum = 47 × 25sum = 1175Ans. There is no such thing as the last or greatest whole number. Hence, \(24,37,58,923>6,47,89,235\). Stay tuned to Embibe for more such informative articles. A number that is not exactly divisible by the number \(2\), is called an Odd Number. Composite numbers: A number is called a composite number it has a least one more factor other than 1 and the number itself. 25,890,800D. Step 2: Add the result of this multiplication and the decimal number will be formed. Properties of Natural Numbers: Some of the properties of natural numbers are as follows: The \(1\)st and the smallest natural number is \(1\). And if the denominator is 100. These are the types of conversions that happen from one number system to another: Decimal to Other Number Systems Binary to Other Number Systems Octal to Other Number Systems Hexadecimal to Other Number Systems Conversion from Decimal to Other Number Systems Decimal Numbers are represented with digits 0-9 and with base 10. An Indian mathematician Aryabhatta is the father of the number system Q.4 What is zero full name? 385B. Zero is an integer. Only \(I, X, C\) and \(M\) can be repeated. If the total number of heads is 90 and the total number of legs is 224. 3,75,750D. If you liked the number system, then do share it with your friends. The properties of numbers make them helpful in performing arithmetic operations on them. Hence, to convert a hexadecimal number to a decimal number, the base of that number is to be changed. Decimal Numbers 0-9 are represented in binary as: 0, 1, 10, 11, 100, 101, 110, 111, 1000, and 1001 For example, 14 can be written as (1110)2, 19 can be written as (10011)2, 50 can be written as (110010)2. Rule 5: If a smaller numeral is placed between two larger numerals, it is always subtracted from the larger numeral immediately following. 300 Solution:- According to the question,1 + 2 + 3 + 4 + ...+ 20 + 21 + 22 + 23 + 24first number = 1last number = 24N = (last number – first number)/class interval + 1N = (24 – 1)/1 + 1N = 23 + 1N = 24Sum of natural numbers = (first number + last number)/2 × nSum = (1 + 24)/2 × 24Sum = (25 × 24)/2Sum = 25 × 12sum = 300Ans. 3,990 Q.7 What is the sum of all natural numbers from 50 to 100?A. All odd numbers will always end with the digits \(1, 3, 5, 7\) or \(9\). Here, each digit in the number is at a specific place with a place value of a product of different powers of 10. 2240B. no factor other than \(1\) and itself. 10 Q.39 The sum of six consecutive even numbers is 102. NCERT Solutions for Number System Chapter Let us look at some of the frequently asked questions about Number System. 720C. It uses 2 digits i.e. 0 and 1 for the creation of numbers. Example :- 2, 4, 6, 8, 10, 12, 14, 16, 18, 20.....infinite Natural numbers which are not exactly divisible by 2 are called Odd Numbers. (c). 1225 Q.17 What is the sum of all odd numbers from 23 to 71?A. For example, \(0\) is a whole number but it is not a natural number. Examples, (255)10 can be written as (FF)16 (1096)10 can be written as (448)16 (4090)10 can be written as (FFA)16 Hexadecimal 0 1 2 3 4 5 6 7 8 9 A B C D E F Decimal 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Conversion of Number Systems Conversion between numbers of systems is quite an easy task. 3,825 Q.8 What is the sum of all the natural numbers from 28 to 45?A. 12,880 Solution:- According to the question,112 + 113 + 114 + ...+ 238 + 239 + 240first number = 112last number = 240N = (last number – first number)/class interval + 1N = (240 – 112)/2 + 1N = 128/2 + 1N = 64 + 1N = 65Sum of natural numbers = (first number + last number)/2 × nSum = (112 + 240)/2 × 65Sum = (352 × 65)/2sum = 176 × 65sum = 11,440Ans. Zero’s real name is Hector Zeroni, but he has been called Zero for most of his life. 10000 Q.36 The sum of five consecutive odd numbers is 145. 3,825 Solution:- According to the question,50 + 51 + 52 + ...+ 98 + 99 + 100first number = 50last number = 100N = (last number – first number)/class interval + 1N = (100 – 50)/1 + 1N = 50 + 1N = 51Sum of natural numbers = (first number + last number)/2 × nSum = (50 + 100)/2 × 51Sum = (150 × 51)/2Sum = 75 × 51sum = 3,825Ans. And their perfect square root never comes out is called Irrational Number. 7,300C. What is the formula of the number system?Ans: The important formula of number system are: (a-b)(a+b)=(a2-b2) (a-b)(a+b)=(a2-b2) (a+b)2=(a2+b2+2ab) (a-b)2=(a2+b2-2ab) (a-b)3=(a3-b3)-3ab(a-b) (a+b+c)2=a2+b2+c2+(ab+bc+ca)(a+b+c)2=a2+b2+c2+2(ab+bc+ca) (a3+b3)=(a+b)(a2-ab+b2)(a3+b3)=(a+b)(a2-ab+b2) (a3-b3)=(a-b)(a2+ab+b2)(a3-b3)=(a-b)(a2+ab+b2) (a3+b3+c3-3abc)=(a+b+c)(a2+b2+c2-ab-bc-ac)(a3+b3+c3-3abc)=(a+b+c)(a2+b2+c2-ab-bc-ac) when a+b+c=0a+b+c=0, then a3+b3+c3=3abca3+b3+c3=3abc. 1870 Solution:- According to the question,1 + 3 + ...+ 67 + 69first number = 1last number = 69N = (last number – first number)/class interval + 1N = (69 – 1)/2 + 1N = 68/2 + 1N = 34 + 1N = 35Sum of natural numbers = (first number + last number)/2 × nSum = (1 + 69)/2 × 35Sum = 70/2 × 35sum = 35 × 35sum = 1225Ans. The second of the next three digits on the left of the group of ones form the group of thousands which is further split up into thousands, ten thousand and hundred thousand. In a given number – Place value of unit digit = unit digit × 1Place value of ten digit = ten digit × 10Place value of hundreds digit = hundreds digit x 100Place value of thousands digit = hundreds digit x 1000Caste value :- Caste value of a digit in a given number is its own value, irrespective of its place. Neutral Integer :- Such an integer on which no flow of positive and negative sign is read, then it is zero. For example: \(14, 15\) are co-primes, while none of \(14\) and \(15\) is a prime number. In this system also, a number is split up into groups or periods. 2640D. 1660D. 25,690,025 Solution:- According to the question,[n (n + 1) / 2]²n = 100[100 (100 + 1) / 2]²[(100 × 101) / 2]²(50 × 101)²(5,050)²25,502,500Ans. Number System Number system is important from the viewpoint of understanding how data are represented before they can be processed by any digital system including a digital computer. Hence, to convert a hex number to an octal number, the base of that number is to be changed Follow the steps given below: Step 1: We need to convert the Hexadecimal number to Binary first. These include: The usual “base ten” or “decimal” system: 1, 2, 3, … , 10, 11, 12, … Q.3 Who is the father of number system? 210B. There are an infinite number of whole numbers or an uncountable number of whole numbers. \(Z {\text{ }} = {\text{ }}\left\{ { – \infty \ldots \ldots . have more than two factors. Follow the steps given below: Step 1: Write the decimal values of the symbols used in the Hex number i.e. from A-F Step 2: Multiply each digit of the Hex number with its place value. 3,240 Q.3 What is the sum of all the numbers from 1 to 24?A. In this, we split up the given numbers into groups or periods. 1,74,880 Solution:- According to the question,n = 80Sum = n (n + 1) (2n + 1) / 6Sum = 80 (80 + 1)(2 × 80 + 1) / 6Sum = 80 × 81 (160 + 1) / 6Sum = 80 × 81 × 161 / 6Sum = 1,73,880Ans. 1225B. 300 Q.4 What is the sum of all the numbers from 1 to 72?A. 6,230B. Step 2: Convert these groups into equivalent octal digits. Note: It should be noted that the number \(1\) is neither prime nor composite. Each question related to number system will be answered in the comments. Octal Numbers can be converted to Decimal values by multiplying each digit with the place value and then adding the result. A combination of rational numbers and irrational numbers is known as real numbers. Hexadecimal Numbers are useful for handling memory address locations.The hexadecimal number system provides a condensed way of representing large binary numbers stored and processed. Step 3: Add the result of multiplications and the final sum will be the decimal number. So, in \(\frac{{ – 3}}{7}\) the numerator is \(-3\) and the denominator is \(7\). Positive Numbers :- All positive numbers from one to infinity are positive integers. If the total number of their legs is 140 and the total number of their heads is 48, then what is the number of chickens? A.22B.26C.28D.30 Solution:- According to the question,Number of four legs = legs/2 – head= 140/2 – 48= 70 – 48= 22Number of two legs = Head – Number of four legs= 48 – 22= 26Ans. 1,73,880D. So, they are prime numbers. 4,400D. The symbol \(X\) can be subtracted from \(L, M\) and \(C\) only.The symbol \(C\) can be subtracted from \(D\) and \(M\) only. \(2\) is the only even prime number. 10,088 Solution:- According to the question,8 + 10 + 12 + ...+ 196 + 198 + 200first number = 8last number = 200N = (last number – first number)/class interval + 1N = (200 – 8)/2 + 1N = 192/2 + 1N = 96 + 1N = 97Sum of natural numbers = (first number + last number)/2 × nSum = (8 + 200)/2 × 97Sum = (208 × 97)/2sum = 104 × 97sum = 10,088Ans. 105 Q.38 The sum of four consecutive even numbers is 36. What is the real number system?Ans: Real numbers are a set of numbers that contains all the rational and the irrational numbers that can be represented on the number line. These numbers can be written in numeric forms and also in words. Q.5 Who is the father of zero? The number system is a method of expressing numerical values. The ones are divided into hundreds, tens, and units. 5 Q.26 What is the place value of 6, 2 in the number 4562? If the base number is 0, 1, 5, 6, unit digit respectively, the answer will also be 0, 1, 5, and 6 respectively. 289D. This is used in different places like the numbering of different volumes or parts of books, numbers of chapters, numbers of issues of magazines numbers on clock faces etc. It uses 8 digits i.e. 0-7 for the creation of Octal Numbers. As a result, the system is known as Hindu-Arabic numerals. 7 Solution:- According to the question,1616/4On dividing the number by 4, the remainder remains 0, so here we will raise the unit’s digit to the power of 4.(9)^49×9×9×981 × 811×1Hence the unit digit will be 1.Ans. Example :- 2, 3, 5, 11, 13, 17, ... The set of at least 2 prime numbers whose HCF is 1 is called Co-Prime Number. 320 Solution : According to the question,1 + 2 + 3 + 4 ..... 18 + 19 + 20 = ?last number = 20first number = 1N = (last number – first number)/class interval + 1N = (20 – 1)/1 + 1N = 19 + 1N = 20Sum = (first number + last number / 2) × nSum = (1 + 20)/2 × 20Sum = (21 × 20)/2sum = 21 × 10sum = 210Ans. Hence, to convert an octal number to a hex number, the base of that number is to be changed. Example :- 1, 2, 3, 4, 5, 6, 7, 8, 9.....infinite Natural numbers which are exactly divisible by 2 are called Even Numbers. The international system of numeration is followed by most of the countries in the world. Q.3. Which is greater \(24,37,58,923\) or \(6,47,89,235\) ?Ans: We can see that \(24,37,58,923\) consists of \(9\) digits while \(6,47,89,235\) consists of \(8\) digits.We know that the number with more digits is greater. Each of the numbers \(4, 6, 8, 9, 10, 12, 14, 15\), etc. It is denoted by \(‘i’\). A system for representing (that is expressing or writing) numbers of a certain type. Solution:- In the number 536487, Caste value of 5 = 5Caste value of 3 = 3Caste value of 6 = 6Caste value of 4 = 4Caste value of 8 = 8Caste value of 7 = 7 Q.33 The average of three consecutive even numbers is 24, then find the smallest even number?A.20B.10C.40D.22 Solution:- According to the question,Three consecutive even numbers – 22, 24, 26Smallest even number = 22Ans. Octal to Binary Conversion Octal numbers are represented in base 8, but the binary numbers are of base 2. 262C. Step 2: Convert each digit into an equivalent group of three binary digits. What is the difference between the largest and the smallest number?A.4B.6C.9D.12 Solution:- According to the question,The sum of four consecutive odd numbers is 72.= 72/4= 18Four consecutive odd numbers – 15, 17, 18, 19, 21Difference of largest and smallest number = 21 – 156Ans. 2,870 Q.19 What is the sum of squares of all natural numbers from 1 to 80?A. All whole numbers are not natural numbers. Types of Number Systems Based on the base value and the number of allowed digits, number systems are of many types. Q. 3,75,750 Q.11 What is the sum of all the even numbers from 2 to 50?A. Hexadecimal to Octal Conversion: Hexadecimal numbers are represented in base 16, but the octal numbers are of base 8. Q.1 1 + 2 + 3 + 4 ..... 18 + 19 + 20 = ?A. Conversion from Octal to Other Number Systems Octal Numbers are represented with digits 0-7 and with base 8. 3,500B. As a result, \(1,2,3,4,.....\) are known as natural numbers. Solution:- In the number 32567809, Place value of 9 ⇒ 9 × 1 = 9Place value of 0 ⇒ 0 × 10 = 00Place value of 8 ⇒ 8 x 100 = 800Place value of 7 ⇒ 7 × 1000 = 7000Place value of 4 ⇒ 4 x 10000 = 40000Place value of 6 ⇒ 6 x 100000 = 600000Place value of 2 ⇒ 2 × 1000000 = 2000000Place value of 1 ⇒ 1 × 10000000 = 10000000 Q.31 Write the caste value of the following digits in the number 78345? 1,780D. We start from the extreme right digit of the given number and move to the left. Ans: By inserting commas to separate periods the given number can be written as: So, the number is \(57,84,93,087\)We observe that the \(8\) in the second place from right is at ten’s place.So, place value of \(8\) in ten’s place \(=8×10=80\).The second \(8\) is at the ten lakh’s place.So, place value of \(8\) in ten lakh’s place \(=8×1000000=8000000\)Hence, the required difference \(=8000000-80=7999920\). We observe that if a is the successor of \(b\), then \(b\) is the predecessor of \(a\). These numbers are also used for measurement and used for labelling. The third group of the next three digits on the left of the group of thousands for the group of millions. In the number system, we learn to use numbers by understanding the number of classes into which the numbers are divided. 1175C. It uses 10 digits i.e. 0-9 for the creation of numbers. 1,71,880C. Binary to Hexadecimal Conversion Binary numbers are represented in base 2 but the Hexadecimal numbers are of base 10. Some of the important types of number systems are given below: Decimal Number System Binary Number System Octal Number System Hexadecimal Number System The Decimal number system is used in usual cases in mathematics. If the second digits from the left are unequal, then the number with greater digit is larger. Now, the steps 3 and 4 are repeated until the quotient obtained becomes 0, and the remainders obtained after each iteration are added to the left of the existing digits. However, the digit: \(7\) has the place value \(7×1=7\), since it is in units place.\(4\) has the place value \(4×10=40\), since it is in tens place.\(8\) has the place value \(8×100=800\), since it is in hundreds place.\(6\) has the place value \(6×1000=6000\), since it is in thousands place. 11,440D. Since our childhood, we are using numbers \(1, 2, 3, 3, 4, …\) to count and calculate. Conversion of a number system means conversion from one base to another. What is the square of the smallest number?A.140B.144C.150D.156 Solution:- According to the question,The sum of six consecutive even numbers is 102.= 102/6= 17Six consecutive even numbers – 12, 14, 16, 17, 18, 20, 22Square of the smallest number = (12)²= 144Ans. 450C. are pairs of co-prime numbers. 25,502,500B. The other three number systems are used at a higher level in Mathematics, Physics, Science & Technology. 3,290C. 2,870C. 1404C. 2,970D. What are the 4 types of number systems?Ans: The four types of number systems are given below: Binary Number System Decimal Number System Octal Number System Hexadecimal Number System. The base 10 number system, also known as the decimal number system, is what we are used to. Step 2: The remainder obtained from the division will become the least significant digit of the new number. 94,125B. Step 4: The remainder obtained will become the second least significant digit i.e. it will be added in the left of the previously obtained digit. 82,543D. Hexadecimal to Binary Conversion Hex numbers are represented in base 16, but the binary numbers are of base 2. After all the iterations are over, the last obtained remainder will be termed as the Most Significant digit. 2,270B. Note: The natural number \(1\) and the whole number \(0\) does not have any predecessor. Hence, to convert an octal number to a binary number, the base of that number is to be changed. starting from right to left i.e. LSB to MSB. Step 3: The quotient obtained from the division will become the next dividend and will be divided by base i.e. 16. These symbols are called digits or figures. Hence, to convert an octal number to a decimal number, the base of that number is to be changed. 820D. There are 12 types of numbers in the number system. Number system examples include : 27,345,2905,.....27,345,2905,..... Follow the steps given below: Step 1: Divide the Decimal Number with the base of the number system to be converted to. All even numbers will always end with the digits \(0, 2, 4, 6\) or \(8\). So now we will write the expanded form of the number\(4000 + 500 + 90 + 2 = \underline {IV} + D + XC + II = \underline {IV} DXCH\)Hence, the required answer is given above. Follow the steps given below: Step 1: Convert the Hex symbols into its equivalent decimal values. If it is divisible, then it is not prime; otherwise, it is prime. If the numbers have an unequal number of digits, then the number with less digits is less than the number with more digits. 900 Solution:- According to the question,28 + 29 + 30 + ...+ 43 + 44 + 45first number = 28last number = 45N = (last number – first number)/class interval + 1N = (45 – 28)/1 + 1N = 17 + 1N = 18Sum of natural numbers = (first number + last number)/2 × nSum = (28 + 45)/2 × 18Sum = (73 × 18)/2Sum = 73 × 9sum = 657Ans. 9,92,340 Solution:- According to the question,500 + 501 + 502 + ...+ 998 + 999 + 1000first number = 500last number = 1000N = (last number – first number)/class interval + 1N = (1000 – 500)/1 + 1N = 500 + 1N = 501Sum of natural numbers = (first number + last number)/2 × nSum = (500 + 1000)/2 × 501Sum = (1500 × 501)/2Sum = 750 × 501Sum = 3,75,750Ans. If the numbers have the same number of digits then go with the step \(2\). Q.5. Write the successor and the predecessor of the number \(400099\).Ans: The successor of \(400099\) is \(400099+1=400100\)And the predecessor of \(400099\) is \(400099-1=400098\). 3,240C. Octal Numbers are useful for the representation of UTF8 Numbers. Binary to Octal Conversion Binary numbers are represented in base 2 but the octal numbers are of base 8. 2,827 Solution:- According to the question,n = 20Sum = n (n + 1) (2n + 1) / 6Sum = 20 (20 + 1)(2 × 20 + 1) / 6Sum = 20 × 21 (40 + 1) / 6Sum = (20 × 21 × 41) / 6sum = 10 × 7 × 41sum = 2,870Ans. Note :- Trick 1. 12,300C. It is represented below in the tabular form: The difference between the Indian and the International system of numeration has been represented below in the table form: NumberIndian SystemInternational System\(1\)One \(=1\)One \(=1\)\(10\)Ten \(=10\)Ten \(=10\)\(100\)Hundred \(=100\)Hundred \(=100\)\(1000\)Thousand \(=1,000\)Thousand \(=1,000\)\(10000\)Ten thousand \(=10,000\)Ten Thousand \(=10,000\)\(100000\)Lakh \(=1,00,000\)Hundred Thousand \(=100,000\)\(1000000\)Ten Lakh \(=10,00,000\)One Million \(=1,000,000\)\(10000000\)One crore \(=1,00,00,000\)Ten Million \(=10,000,000\)\(100000000\)Ten Crore \(=10,00,00,000\)Hundred Million \(=100,000,000\)\(1000000000\)Hundred Crore \(=100,00,00,000\)One Billion \(=1,000,000,000\) To compare the numbers, follow the given steps: Obtain the numbers and check the number of digits in each number. There is a glance at methods of numeration, Indian system, international system of numbers, place value, comparison of numbers, the number zero, successor and predecessor of whole numbers, Roman numerals, prime and composite numbers, and co-prime numbers. Step 2: Now to convert the binary number to Hex number, divide the binary digits into groups of four digits starting from right to left i.e. from LSB to MSB. Negative Integers: \(-1, -2, -3…..\) are the set of all the negative integers. Step 2: The second group of the next two digits on the left of the group of ones form the group of thousands which is further split into thousands and ten thousand. 2640 Q.6 What is the sum of all natural numbers from 42 to 98?A. Every natural number (except \(1\)) can be obtained by adding \(1\) to the previous natural number. 6 Q.41 The sum of six consecutive odd numbers is 180. Step 5: For values from 10-15, convert it into Hex symbols i.e from A-F. The groups are called ones, thousands, millions, and billions. Follow the steps given below: Step 1: Multiply each digit of the Binary number with the place value of that digit, starting from right to left i.e. from LSB to MSB. In number system, we study and understand numbers from 0 to infinity. Rule 3: If a symbol of a smaller value is written to the left of a symbol of greater value, its value is subtracted from the value of the greater symbol. Describe the number system with an example.Ans: We have several ways to represent counting numbers. 40358 Q.1 What is the definition of a number system? Read More :SimplificationProfit and LossSimple InterestCompound Interest Hope you have liked the information about number system. The numbers \(1, 2, 3, 4, ….\) etc. Some Important Facts: \(2\) is the smallest prime number. Step 3: Add zeros prior to MSB to make it a proper group of four digits(if required) Step 4: Now convert these groups into their relevant decimal values. 1,256B. 625 Q.37 The sum of five consecutive odd numbers is 55. Other number systems are Number System Binary (base 2), Number System Hexadecimal (base 16), and Octal (base 8). 144 Q.40 The sum of four consecutive odd numbers is 72. Clearly, the predecessor of \(1\) is \(0\); predecessor of \(2\) is \(1\); and so on. The concept of Successor and Predecessor in the number system is generally applicable for natural numbers, whole numbers, and integers. Solution:- In the number 12645890, Place value of 0 ⇒ 0 × 1 = 0Place value of 9 ⇒ 9 × 10 = 90Place value of 8 ⇒ 8 x 100 = 800Place value of 5 ⇒ 5 × 1000 = 5000Place value of 4 ⇒ 4 x 10000 = 40000Place value of 6 ⇒ 6 x 100000 = 600000Place value of 2 ⇒ 2 × 1000000 = 2000000Place value of 1 ⇒ 1 × 10000000 = 10000000 Q.29 Write the place value of the following digits in the number 481235? Binary Numbers are represented with digits 0 and 1 and with base 2. 1 Q.25 (879345)^2836A.1B.3C.5D.7 Solution:- According to the question,2836/4On dividing the number by 4, the remainder remains 0, so here we will raise the unit’s digit to the power of 4.(5)^45×5×5×525×255 × 525Hence the unit digit will be 5.Ans. Positive Number Negative Number Neutral Integer (a). Example of 19 in the binary system Here 19 Or (19)10 can be written as (10011)2 Octal Number System Octal Number System is one in which the base value is 8. Similarly, the face value of \(4, 8\) and \(6\) are also \(4, 8\) and \(6\) respectively. Read this article to learn more about Number systems. You can write us a mail at or call 18002572961 (Toll-Free). For example: instead of reading \(527\) as Five, two, seven, it is easy to read as Five hundred and twenty-seven. For example: \(59, 456, 2986\) etc, are numerals. (q denominator should not be zero) Example :- 3/4, 7/12, 17/19, √125, √625 Numbers that cannot be written in the form of p/q are usually written inside (√). 8,008D. Then, we discussed the real, rational, irrational, imaginary, integers, complex, even, odd, natural, and whole numbers, and then explained the properties of natural and whole numbers. 1B. Positive Integers: \(1, 2, 3, 4…..\) are the set of all positive integers. Non-Positive and Non-Negative Integer: \(0\) is neither the positive integer nor the negative integer. Number Systems The Formulas of the number system are given below: (a-b)(a+b)=(a2-b2)(a-b)(a+b)=(a2-b2) (a+b)2=(a2+b2+2ab)(a+b)2=(a2+b2+2ab) (a-b)2=(a2+b2-2ab)(a-b)2=(a2+b2-2ab) (a+b+c)2=a2+b2+c2+(ab+bc+ca)(a+b+c)2=a2+b2+c2+2(ab+bc+ca) (a3+b3)=(a+b)(a2-ab+b2)(a3+b3)=(a+b)(a2-ab+b2) (a3-b3)=(a-b)(a2+ab+b2)(a3-b3)=(a-b)(a2+ab+b2) (a3+b3+c3-3abc)=(a+b+c)(a2+b2+c2-ab-bc-ac)(a3+b3+c3-3abc)=(a+b+c)(a2+b2+c2-ab-bc-ac). Every number used in counting is called a Natural Number. When counting objects in a group, we begin with one and work our way up to two, three, four, and so on. 385 Q.22 What is the sum of cubes of all natural numbers from 1 to 100?A. If the second digits from the left are equal, then compare the third digits from the left and continue the above procedure. So what is the product of the multiplication of the largest and the smallest number?A.100B.105C.110D.120 Solution:- According to the question,The sum of five consecutive odd numbers is 55.= 55/5= 11Five consecutive odd numbers – 7, 9, 11, 13, 15Product of the largest and smallest number = 7 × 15105Ans. Aryabhata, a great astronomer of the classic age of India was the one who invented the digit “0” (zero) for which he became immortal but later on is given to Brahmagupta who lived around a century later 22, another ancient Indian mathematician. Then find the square of the smallest odd number?A.625B.620C.630D.650 Solution:- According to the question,The sum of five consecutive odd numbers is 145.= 145/5= 29Five consecutive odd numbers – 25, 27, 29, 31, 33Square of the smallest odd number = (25)²625Ans. These natural numbers along with the number zero \(0\) form the collection of whole numbers. Here the conversion is to octal, hence the divisor will be 8. One of the earliest systems of numeration, still in common use today, was developed by Romans and is known as the Roman numeral system. Follow the steps given below: Step 1: Multiply each digit of the Octal number with the place value of that digit, starting from right to left i.e. from LSB to MSB. Example :- 3/5, 7/11, 19/13, √121, √147, √973 It is an imaginary number that does not have a real number. It is evident from this that a number is the sum of the place values of all its digits. Read More: Numbers Whole Numbers Prime Numbers Composite Numbers If you are going to read all the information about number system on this page, then definitely read this article completely. We have shared the post of Counting Chart on the previous page, so must read this post as well. There are infinitely many natural numbers. The numbers formed using these two digits are termed Binary Numbers. 246B. A number system is a method of expressing numbers by writing, that is mathematical notation for representing the numbers of a given set, by using the numbers or symbols in a consistent manner. The number zero is denoted with the \(‘0’\) symbol. For example: \(VI=5+1=6, VII=5+2=7, VIII=5+3=8\)\(XI=10+1=11, XII=10+2=12\)\(LXV=50+10+5=65\) etc. 2980 Solution:- According to the question,21 + 22 + 23 + ...+ 73 + 74 + 75first number = 21last number = 75N = (last number – first number)/class interval + 1N = (75 – 21)/1 + 1N = 54 + 1N = 55Sum of natural numbers = (first number + last number)/2 × nSum = (21 + 75)/2 × 55Sum = 96/2 × 55Sum = 48 × 55sum = 2640 Ans. And some goats are specially climbing under the tree. Natural numbers, fractions, and decimals all come under this category. When zero is included in a natural number, it becomes a Whole Number. All the natural numbers are whole numbers. It is neither positive nor negative. Notation: The method of denoting a number in digits or figures is known as notation. The smallest natural number is \(1\). Rule to check whether a number between \(100\) and \(200\) is prime or not: Examine whether the given number is divisible by any prime number less than \(15\) i.e., \(2, 3, 5, 7, 11\) and \(13\). 2,208C. 3,860 Solution:- According to the question,1 + 2 + 3 + 4 ..... 78 + 79 + 80 = ?last number = 80first number = 1N = (last number – first number)/class interval + 1N = (80 – 1)/1 + 1N = 79 + 1N = 80Sum = (first number + last number / 2) × nSum = (1 + 80)/2 × 80Sum = (81 × 80)/2sum = 81 × 40sum = 3,240Ans. 11,330B. 26 Q.46 In a division problem, the quotient is 403. Decimal to Hexadecimal Conversion Hexadecimal Numbers are represented in base 16. Follow the steps given below: Step 1: Divide the Decimal Number with the base of the number system to be converted to. What is a Decimal Number System?Ans: A Decimal Number System is one that has a base 10 and uses ten digits, starting from 0 to 9. Compare the digits at the leftmost place in both numbers. Also, Place value of a digit \(=\) Face value \(\times \) Position value. Solution:- In the number 481235, Place value of 5 ⇒ 5 × 1 = 5Place value of 3 ⇒ 3 × 10 = 30Place value of 2 ⇒ 2 x 100 = 200Place value of 1 ⇒ 1 × 1000 = 1000Place value of 8 ⇒ 8 x 10000 = 80000Place value of 4 ⇒ 4 x 100000 = 400000 Q.30 Write the place value of the following digits in the number 32567809? 4D. Q.2 What is number system with example? Q.2. How many \(5\)-digit numbers are there in all?Ans: The largest \(5\)-digit number \(=10000\)\(..\) Numbers of all \(5\)-digit numbers \(=99999-10000+1\)\(=89999+1\)\(=90000\)Hence, the number of all \(5\)-digit number is ninety thousand. 657 Q.9 What is the sum of all natural numbers from 250 to 500?A. All other even numbers are composite numbers. Example :- √- 3, √-4, √-12, √-17, √-107 etc. Step 2: Convert these groups into equivalent hex digits. 3,587C. 25,578,900C. However, the fractional numbers like \(\frac{5}{ {11}},\,\frac{ {27}}{4},\,\frac{ {123}}{ {5948}}\) and decimal numbers like \(7.54, 36.98, 675.563\) are not natural numbers. Three digits on the left of the group of millions form a group of billions which is split into billions, ten billion and a hundred billion. 1664 Solution:- According to the question,2 + 4 + 6 +.....+ 46 + 48 + 50N = (last number – first number)/2 + 1N = (50 – 2)/2 + 1N = 48/2 + 1N = 24 + 1N = 25Sum = (first number + last number)/2 × nSum = (2 + 50)/2 × 25Sum = 52/2 × 25sum = 26 × 54sum = 1404Ans. He has been homeless for most of his life, and his mother abandoned (or lost) him when he was still small. Number system based on place value and caste value Place Value :- Two or more symbols are used in the number system based on place value. 8,008 Q.14 What is the sum of all even numbers from 8 to 200?A. Solution:- According to the question,Dividend = ?Quotient = 403remainder = 58divisor = 100Dividend = (Divisor × Quotient) + RemainderDividend = (100 × 403) + 58Dividend = 40300 + 58Dividend = 40358Ans. If zero is added to any number, the result remains the same. Such numbers are called composite numbers as defined below. 14,720 Solution: According to question,n = 32Sum = n (n + 1) (2n + 1) / 6Sum = 32 (32 + 1)(2 × 32 + 1) / 6Sum = 32 × 33 (64 + 1) / 6Sum = (32 × 33 × 65) / 6sum = 16 × 11 × 65sum = 11,440Ans. How many types of numbers are there?Ans: There are six types of numbers given below: Natural numbers Whole numbers Integers Rational numbers Irrational numbers Real numbers. While reading numbers it is always easy to use the words instead of reading individual digits. 9,84,125B. Trick 3. 68 Q.45 A person has some hens and cows. 99,234 Solution:- According to the question,250 + 251 + 252 + ...+ 498 + 499 + 500first number = 250last number = 500N = (last number – first number)/class interval + 1N = (500 – 250)/1 + 1N = 250 + 1N = 251Sum of natural numbers = (first number + last number)/2 × nSum = (250 + 500)/2 × 251Sum = (750 × 251)/2Sum = 375 × 251sum = 94,125Ans. Predecessor: The predecessor of a number is one less than the given number. 8 Q.24 (32589)^1616A. Q.4. Write the Roman numeral for the given number:Ans: We have \(4592\). 11,440 Q.16 Find the sum of all the odd numbers from 1 to 69?A. So tell what is the total number of pigeons?A.68B.70C.72D.76 Solution:- According to the question,Number of four legs = legs/2 – head= 224/2 – 90= 112 – 90= 22Number of two legs = Head – Number of four legs= 90 – 22= 68Ans. all the numbers up to infinity. Successor: The successor of a number is the number obtained by adding \(1\) to it. We cannot complete the counting of the natural numbers. 657B. Unreal Numbers or imaginary numbers are represented by units. In lower grades, we learned how to count numbers. Clearly, the understanding of the number system in computer is very useful in our daily life. So let’s read and understand the definition of number system, all formulas of number system, types of number system, tricks to solve number system questions and questions related to number system with solutions. Example :- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.....infinite A natural number which is divisible by at least one other number other than itself and 1 is called a Composite Number. A number system is used for counting numbers and hence finds application in arithmetic calculations. Numeration: The method of representing a number in words is known as numeration. If you want to ask any question related to number system, then definitely ask in the comment section. Following are the conversions of the Octal Number System to other Number Systems: Octal to Decimal Conversion Octal numbers are represented in base 8, but the decimal numbers are of base 10. An irrational number is defined as the number that cannot be expressed in the form of \(\frac{p}{q}\), where \(p\) and \(q\) are co-prime integers and \(q≠0\). a system to represent or express numbers. 3000 Solution:- According to the question,1 + 2 + 3 + 4 + ...+ 70 + 71 + 72first number = 1last number = 72N = (last number – first number)/class interval + 1N = (72 – 1)/1 + 1N = 71 + 1N = 72Sum of natural numbers = (first number + last number)/2 × nSum = (1 + 72)/2 × 72Sum = (73 × 72)/2Sum = 73 × 36sum = 2628Ans. In the Indian system of numeration, each digit of a number has a place value and a face value. It is how we represent or name the numbers. Here the conversion is to binary, hence the divisor will be 2. Solution:- In the number 45623, Place value of 3 ⇒ 3 × 1 = 6Place value of 6 ⇒ 6 x 100 = 600Place value of 4 ⇒ 4 x 10000 = 40000 Q.28 Write the place value of the following digits in the number 12645890? These numerals are of Indian origin, and they were adopted by the Arabs and spread across Europe. For example: \(XIV=10+5-1=14\)\(XIX=10+10-1=19\)\(CXIV=100+10+5-1=114\) Rule 6: If a bar is placed over a