1 Write a non-static method “getSum(int N)” to calculate the sum from 1

to N numbers where N is the argument.

public class SumCalculator {

    public int getSum(int N) {

        if (N < 1) {

            return 0; // Handle cases where N is less than 1

        }

        int sum = 0;

        for (int i = 1; i <= N; i++) {

            sum += i;

        }

        return sum;

    }

    public int getSumFormula(int N) {

        if (N < 1) {

            return 0;

        }

        return N \* (N + 1) / 2;

    }

    public static void main(String[] args) {

        SumCalculator calculator = new SumCalculator();

        int N1 = 5;

        int sum1 = calculator.getSum(N1);

        System.out.println("Sum from 1 to " + N1 + " (loop): " + sum1);

        int N2 = 10;

        int sum2 = calculator.getSumFormula(N2);

        System.out.println("Sum from 1 to " + N2 + " (formula): " + sum2);

    }

}

2 Write a non-static method to find largest number from array which is

taken as input to the method “getMaxValueFromArray()”

public class ArrayOperations {

    public int getMaxValueFromArray(int[] numbers) {

        if (numbers == null || numbers.length == 0) {

            throw new IllegalArgumentException("Input array cannot be null or empty.");

        }

        int maxValue = numbers[0];

        for (int i = 1; i < numbers.length; i++) {

            if (numbers[i] > maxValue) {

                maxValue = numbers[i];

        }

        return maxValue;

    }

    public static void main(String[] args) {

        ArrayOperations op = new ArrayOperations(); // Create an instance of the class

        int[] myArray = {10, 5, 20, 8, 15};

        int largest = op.getMaxValueFromArray(myArray); // Call the non-static method

        System.out.println("The largest value in the array is: " + largest); // Output: 20

    }

}

3 Create two static methods in 1 class ‘getMaxValue()’ and the

‘getMinValue()’ to print the maximum and minimum numbers

respectively among three numbers taken as arguments for both

methods.

public class NumberOperations {

    public static void getMaxValue(int num1, int num2, int num3) {

        int max = num1;

        if (num2 > max) {

            max = num2;

        }

        if (num3 > max) {

            max = num3;

        }

        System.out.println("Maximum value: " + max);

    }

    public static void getMinValue(int num1, int num2, int num3) {

        int min = num1;

        if (num2 < min) {

            min = num2;

        }

        if (num3 < min) {

            min = num3;

        }

        System.out.println("Minimum value: " + min);

    }

    public static void main(String[] args) {

        getMaxValue(10, 5, 20); // Output: Maximum value: 20

        getMinValue(10, 5, 20); // Output: Minimum value: 5

        getMaxValue(-1, -5, 0); // Output: Maximum value: 0

        getMinValue(-1, -5, 0); // Output: Minimum value: -

4 Define a class ‘Calculator’ with static methods for basic arithmetic

operations like “add(int a, int b), add(double a, double b), subtract(int a,

int b), and subtract(double a, double b)”

. Output should be displayed

properly in console in respective data types.

public class Calculator {

    // Static method to add two integers

    public static int add(int a, int b) {

        return a + b;

    }

    // Static method to add two doubles (method overloading)

    public static double add(double a, double b) {

        return a + b;

    }

    // Static method to subtract two integers

    public static int subtract(int a, int b) {

        return a - b;

    }

    // Static method to subtract two doubles (method overloading)

    public static double subtract(double a, double b) {

        return a - b;

    }

    public static void main(String[] args) {

        // Demonstrate integer operations

        int intSum = Calculator.add(10, 5);

        System.out.println("Integer Addition: " + intSum);

        int intDifference = Calculator.subtract(10, 5);

        System.out.println("Integer Subtraction: " + intDifference);

        // Demonstrate double operations

        double doubleSum = Calculator.add(10.5, 5.2);

        System.out.println("Double Addition: " + doubleSum);

        double doubleDifference = Calculator.subtract(10.5, 5.2);

        System.out.println("Double Subtraction: " + doubleDifference);

    }

}

5 Write a static method to print odd numbers from 1 to 50

public class OddNumberPrinter {

    public static void printOddNumbers() {

        System.out.println("Odd numbers from 1 to 50:");

        for (int i = 1; i <= 50; i++) {

            if (i % 2 != 0) { // Check if the number is odd

                System.out.println(i);

            }

        }

    }

    public static void main(String[] args) {

        printOddNumbers(); // Call the static method

    }

}

6 Write method “printTable(int num)” to print the multiplication table for a given number o E.g., for 5: 5 × 1 = 5, ..., 5 × 10 = 50

public class MultiplicationTable {

    public static void printTable(int num) {

        for (int i = 1; i <= 10; i++) {

            System.out.println(num + " × " + i + " = " + (num \* i));

        }

    }

}