

1. What is method overloading?

- Method overloading is demonstrated in the code with two `add()` methods that have different parameter types (int and double). It allows multiple methods with the same name but different parameter lists to exist in the same class.

2. How do you handle divide-by-zero?

- The code handles division by zero in the `divide()` method by throwing an `ArithmeticException` with a descriptive message.

3. Difference between `==` and `.equals()`?

- `==` compares object references (memory addresses) for objects and values for primitives
- `.equals()` compares the content/value of objects

4. Basic data types in Java:

- byte, short, int, long (integer types)
- float, double (floating-point types)
- char (character type)
- boolean (logical type)

5. How is Scanner used for input?

- The code uses Scanner to read user input from the console with `Scanner sc = new Scanner(System.in)` and `sc.nextLine()` to read lines of text.

6. Role of a loop:

- In this code, the main while loop (`while (continueCalculating)`) allows the calculator to keep running until the user chooses to exit.

7. Difference between while and for loop:

- while loop: used when number of iterations is unknown (like in our calculator)
- for loop: used when number of iterations is known (like when processing tokens in the expression)

8. What is the JVM?

- Java Virtual Machine (JVM) is the runtime environment that executes Java bytecode. It provides platform independence and manages memory.

9. How is Java platform-independent?

- Java achieves platform independence through the "Write Once, Run Anywhere" principle. Java code is compiled to bytecode (.class files) which can run on any platform with a JVM.

10. How do you debug a Java program?

- Use IDE debugger to set breakpoints
- Add print statements for debugging
- Check stack traces from exceptions
- Use logging frameworks
- Step through code execution
- Inspect variable values during runtime