1. Use a decision structure to write an appropriate statement for each of the following:
a) Display Great job! when grade is 90 or higher.
If (grade >= 90) { system.out.print(“Great job!”);
b) Display Error when number is less than 20 or greater than 50.
If (number < 20 && number > 50) { system.out.print(ERROR);}

2. Assume num1 and num2 contain integer values. Write an if-else if statement that displays one of the following messages as appropriate: First number is larger. Second number is larger. Numbers are equal.

```
if (num1 > num2) {
   System.out.println("First number is larger.");
} else if (num2 > num1) {
   System.out.println("Second number is larger.");
} else {
   System.out.println("Numbers are equal.");
}
```

3. a) Which is the appropriate word, odd or even for the blanks below?

```
if (num % 2 == 0) { System.out.println("___ number"); } else { System.out.println("___ number");}
if (num % 2 == 0) {
   System.out.println("even number");
} else {
   System.out.println("odd number");
}
```

b) Rewrite the if-else as a switch statement.

```
switch (num % 2) {
   case 0:
      System.out.println("even number");
      break;
   default:
      System.out.println("odd number");
      break;
}
```

4. The nextInt() method in the Random class generates a random integer between 0 and a specified maximum value. Write a formula that includes the nextInt() method for each of the following situations:
a) Generate a random integer between 1 and 50.
int num = rand.nextInt(50) + 1;
b) Generate a random integer between 20 and 100.
int num = rand.nextInt(81) + 20;
c) Generate a random double between 10 and 20, inclusive.
double num = rand.nextDouble() * 10 + 10;

5. Identify the logic errors in the statements below, which should display a single appropriate message for any value of age:
if (age < 18) { System.out.println("child"); } else if (age > 18 && age < 65) { System.out.println("adult"); } else if (age > 65) { System.out.println("senior"); }

The second condition uses age > 18 instead of age >= 18.
The third condition uses age > 65 instead of age >= 65.
This means:
If age == 18  no message displays.
If age == 65 no message displays.

6. Given the following assignments, determine if each of the following expressions evaluates to true or false:
size = 100 weight = 50 value = 75
a) size > 50 && weight == 50 T
b) value < 100 && !(weight == 50) F
c) size >= 100 || value >= 100 T
d) weight < 50 || size > 50 T
e) !(value < 75) T
f) !(size > 100 && weight >50 && value > 75) T
g) (value < 125 || weight < 76) && size ==100 T

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