What: Early Evaluation Exam When: Wednesday February 10, 2016 Where: AC C118

Name/Username: _____

Please state the type and value of each of the following expressions:

1. `7 % 3`
2. `4 % 5`
3. `7 / 3`
4. `4 / 5`
5. `true && false`
6. `true || false`
7. `'5' – '3'`
8. `2 + 3 * 4`
9. `1 / 2 * 4`
10. `4 * 1 / 2`
11. `1 + 2 + "3"`
12. `(1 + 2) + "3"`
13. `"what".substring(1)`
14. `"what".charAt(1)`
15. `"what".substring(1,3)`
16. `"\\\"".length()`
17. `(char) ('5' - 2)`
18[1]. `(x > 3) || (x < 5)`

If b is a variable of type boolean and n a variable of type `int` please simplify the following expressions:

19. `b != true`
20. `b != false`
21. `b && false`
22. `b || false`
23. `b || !b`
24. `! (b && true)`
25. `(n > 3) && (n < 5)`
26. `(n < 3) && (n > 5)`
27. `(n > 3) || (n > 5)`
28. `(n > 3) && (n > 5)`
29. `(!b) && (n != 0)`
30 `n == 0 ? b = true : b = false`
31. `if (n == 0) { b = true; } else { b = false; }`
32. `if (n == 0) { b = false; } else { b = true; }`
33. `b = false; if (n > 1) { if (n > 2) { b = true; } }`
34. `if (n < 1) { b = true; } else { b = n > 2; }`

[1] Assume `x` is a variable of type `int`.

Consider the following program. What does it print?

```
public class One {
  public static int f(int n) { return 2 * n; }
  public static int g(int n) { return n - 1; }
  public static int h(int n) { return 3 * f(n) + 1; }
  public static void main(String[] args) {
    System.out.println( f(3) );         // 35.
    System.out.println( g(h(3)) );      // 36.
    System.out.println( h(h(2)) );      // 37.
    System.out.println( f(h(1)) );      // 38.
    System.out.println( f(g(h(1))) );   // 39.
  }
}
```

For each of the following loops determine if the loops are infinite or not:

40.
```
for (int i = 0; i < 10; i--) {
  System.out.println(i);
}
```

41.
```
for (int i = 0; i < 10; i--) {
  System.out.println(i);
  i += 3;
}
```

42.
```
for (int i = 0; i != 10; i--) {
  System.out.println(i);
  i += 3;
}
```

43.
```
for (int i = 0; i++ != 10;   ) {
  System.out.println(i);
}
```

For each of the following code fragments determine the value of y at the end:

44. `int x = 18, y = 10; if (x < 10) { if (x > 5) y = 1; } else y = 2;`

45. `int x = 18, y = 10; if (x < 10) if (x > 5) y = 1; else y = 2;`

46. `int y = 6; y = --y - y--;`

Please determine the values of x and y at the end of each of the following code fragments:

47.
```
int x = 1, y = 2;
while ( x < y ) {
  y = x + y;
  x = x + y;
}
```

48.
```
int x = 1, y = 2;
while ( x++ < y ) {
  x = x++ + ++y;
  y = ++x - --y;
}
```