Some revision questions for COMP131 written exam 1

Note: these revision questions cover *only* hypothesis testing and Boolean expressions. The exam covers everything up to and including topic 16.

1. After driving from Carlisle to Harrisburg many times, I determine that the freeway route averages 35 minutes with a standard deviation of 10 minutes, where is the route on surface streets averages 43 minutes with a standard deviation of 5 minutes. Is the hypothesis that the freeway is faster supported strongly, weakly, or not at all according to the criterion taught in his course? Explain your answer.

Solution: the one standard deviation interval for freeway is 35+/-10, or [25,45]. The one standard deviation interval for surface streets is 43+/-5, or [38,48]. The mean value for surface streets (43) lies inside the interval for freeways. Hence, the hypothesis is is not supported by the data.

For the remaining questions, assume the following local variable declarations:

```
int x = 7;
int y = -3;
boolean a = true;
boolean b = false;
```

2. What is the value of each of the following Boolean expressions?

```
  i.  (x <= 0) && (y > 0);        false
 ii.  (x == 9) && (y > 2);        false
iii.  !((x > 0) && !(y < 0));     true
 iv.  a;                          true
  v.  a || b;                     true
 vi.  a && !b;                    true
vii.  !(a && x < 10 && y > 0);    true
```

3. What is the output of each of the following fragments of code?

(i)
```
if (b) {
     System.out.println("apple");
} else {
     System.out.println("banana");
}
```

(ii)
```
if (a && !b) {
     System.out.println("apple");
} else {
     System.out.println("banana");
}
```

(iii)
```
if (a == true) {
     System.out.println("apple");
} else {
     System.out.println("banana");
}
```

(iv)
```
if (a) {
      System.out.println("apple");
} else {
      System.out.println("banana");
}
```

(v)
```
if (b == false) {
      System.out.println("apple");
} else {
      System.out.println("banana");
}
```

(vi)
```
if (!b) {
      System.out.println("apple");
} else {
      System.out.println("banana");
}
```