PS 1: Part I

Problem 1: Java programming basics

1-1)

```
/*
* Problem1.java
*
* A program with lots of syntax errors!
*/

import java.util.*;

public class Problem1 {
   /*
    * This static method should take an integer x and return:
    *    - the opposite of x when x is negative
    *    - 10 more than x when x is non-negative and even
    *    - the unchanged value of x when x is non-negative and odd
    */
   public static int adjust(int x) {
       if (x < 0) {
           x *= -1;
       } else if (x % 2 == 0) {
           x += 10;
       }

       return x;
   }

   public static void main(String[] args) {
       Scanner console = new Scanner(System.in);

       System.out.print("Enter an integer x: ");
       int x = console.nextInt();

       System.out.println("adjust(x) = " + adjust(x));
   }

}
```

1-2)

a) 5.75
b) 5
c) 27.0
d) xy
e) 5
f) true
g) 14
h) 12
i) 13CS
j) CS112

In particular, floating-point values should have a decimal and strings should be surrounded by double quotes. <------ overlooked instruction in the question

d. "xy"

// type cast

i. "13CS"
j. "CS112" ????

https://www.geeksforgeeks.org/gfact-49-print-integer-between-strings-in-java/

Problem 2: Conditional execution

2-1)

a)
```
Terriers
Crimson
Let’s go!
```

b)
```
Terriers
Crimson
Let’s go!
```

c)
```
Bears
Let’s go!
```

d)
```
Big Green
Big Red
Bulldogs
Let’s go!
```

e)
```
Huskies
Let’s go!
```

f)
```
Big Green
Bulldogs
Let’s go!
```

2-2)

```
if (a < c) {
        System.out.println("Lions");
    }

/* Whether a < c or not is checked earlier in the first if block (a <= c), so
* if the else if statement of (b < a) is hit, the underlying fact is that a
* must be larger than c, which contradicts with this (a<c) shown above. This
* print statement won't be printed at all.
* /

if (!(b > c)) {
        System.out.println("Quakers");
    }

/* To execute this print statement, b must be less than or equal to c.
* However, this if statement is under the else statement, which is hit when
* confirming that (a > c) and (b >= a). The logic shows that (b >= a > c). So,
* b can never be lower than or equal to c, and this print statement shown
* above will not be executed for any set of inputs.
*/
```

Problem 3: Static methods

3-1

variables that belong to main()

x	y
1	3
4	~~27~~
	27

// show how the variables changed over time, not just the starting/ending values

variables that belong to compute()

x	y
1	3
4	2
3	3
6	0
3	4
6	2

output (the lines printed by the program)

```
1 3
4 2
4 3
6 0
4 3
6 2
4 27
```

3-2)

```
public static double bmi(int w, int h) {
      double result = (720.0 * w) / (h * h);
      return result
}
```

Problem 4: Loops

4-1)

```
for (int i = 0; i < 2022; i++) {
    System.out.println("Twenty two!");
}
```

4-2)

```
public static void countDown(int n) {
    int count = n;
    while (count >= 1) {
        System.out.println(count);
        count--;
    }
}
```

4-3)

```
for (int i = 1; i <= 3; i++) {
    System.out.println("** " + i + " **");
    for (int j = 3; j >= i; j--) {
        System.out.println(i + " " + j);
    }
}
```