Methods & Variables Challenge Sheet (Day 1)

1.

Which of the following are legal int literals? - do together
   a. `1.5`
   b. `5.`
   c. `-6875309`
   d. `2.3`
   e. `-1`
   f. `10.0`
   g. `'7'`
   h. `22`

2.

What is the output from the following statements? Write what you think it will be, then type it in.
   a. `System.out.print(5 / 10);`
   b. `System.out.print(1 / 2 * 10);`
   c. `System.out.print(1.0 / 2 * 10);`
   d. `System.out.print(1 / 2.0 * 10);`
   e. `System.out.print(13 % 5);`

3.

a. Assuming:
```
double rate = 1.058;
int balance0 = 100, balance = (int) (balance0 * rate);
```

What is the value of `balance`? Try it, then test it in JGrasp.

b. Assuming:
```
int miles = 98, gallons = 5;
double gasMileage = miles / gallons;
```

What is the value of `gasMileage`? Try it then test it in JGrasp.

4. Trace the evaluation of the following expressions, and give their resulting values. Make sure to give a value of the appropriate type (such as including a .0 at the end of a double).

    a. `2 + 3 * 4 - 6`
    b. `14 / 7 * 2 + 30 / 5 + 1`
    c. `14 / 7 * 2 + 30 / 5 + 1`
    d. `(238 % 10 + 3) % 7`
    e. `(18 - 7) * (43 % 10)`
    f. `2 + 19 % 5 - (11 * (5 / 2))`
    g. `813 % 100 / 3 + 2.4`

5. If `double x` has a negative value, write an expression that rounds x to the nearest integer.

6. Create a method that:
    a. Adds two numbers together
    b. Multiplies two numbers together
    c. Finds the area of a rectangle
    d. Finds the area of a square
    e. Finds the area of a triangle using its base and height
    f. Find the area of a triangle using the length of its three sides
    g. Prints out someone's full name using two variables (`firstName` and `lastName`)

7. Challenge: Use JGrasp to write a program that, given a positive integer n, computes a new integer in which the ones and tens digits have swapped places. For example, if n = 123, the result should be 132; if n = 3, the tens digit is zero and the result should be 30. Hint: Use integer division.

Methods & Variables Answer Sheet (Day 1)

1. c, e, h (Practice-It)
2. (Java Methods Book)
   a. 0
   b. 0
   c. 5.0
   d. 5.0
   e. 3
3. (Java Methods Book)
   a. 105
   b. 19
4. (Practice-It)
   a. 8
   b. 11
   c. 6
   d. 4
   e. -33
   f. 16
   g. 6.4
5. int newX = (double) (x + .5); (Java Methods Book)
6. Check by testing in Java.
7. (Java Methods Book) Could be this or something similar, best way to test is to write the program and run it:

   ```
   int units = n%10;
   n -= units;
   int tens = (n%100);
   n -= tens;
   n += units * 10 + tens/10;
   ```