Name _____

Date _____ Period _____

1)  For 1 to 5, provide the resultant value and data type.  If there is more than one data type possible, please list all of these.

VALUE     DATA TYPE

a)  `(int)(74.6 + 67.2 / 14.4) % 14`  _____  _____

b)  `(double) 55 / 4 - (int) 5.6 * 3`  _____  _____

c)  `(char)(85 + 3 % 14 - 92 / 7 % 11)`  _____  _____

d)  `18 - 4 + 125 / 17 % 6`  _____  _____

e)  `(double)(34/8) + (int)'V' / 11`  _____  _____

2)  Write what will show in the terminal window when the program below is executed. (Assume it runs.)

```
public class GuessIt {
    public static char Abra(char ch) {
        char cadabra = (char) ((int) ch % 65 + 97);
        return cadabra;
    }
    public static void main(String[] args) {
        String str = "cat";
        System.out.println(str);
        str = "" + Abra('A');
        str = str + Abra('H');
        System.out.println(str);
    }
}
```

3) Consider the program below:

```
/*  1 */ import java.util.Scanner;
/*  2 */ public class NamePrint {
/*  3 */     public static void main (String [] args) {
/*  4 */             String name;
/*  5 */             double age;
/*  6 */             Scanner _____Q1_____ = new Scanner(___Q2___);
/*  7 */
/*  8 */             System.out.print("\nEnter your name -> ");
/*  9 */             name = keyinput.___Q3___();// two possible answers (I'll accept either)
/* 10 */
/* 11 */             System.out.print("\nEnter your age -> ");
/* 12 */             age = keyinput.___Q4___();
/* 13 */
/* 14 */
/* 15 */             System.out.print(Format.left("\t Your name is:" + name, 25));
/* 16 */             System.out.print("\n Age:" ___Q5___ Format.right(age, 7, 1));//Q5 is a symbol
/* 17 */
/* 18 */             int numLY = (int) (age / 4);
/* 19 */
/* 20 */             System.out.println("\nThe number of leap years ");
/* 21 */             System.out.print("during your life:" + _____Q6_____);
/* 22 */             //Q6 should print the value of numLY at the center of a 15-character space
/* 23 */             System.out.print("\n");
/* 24 */     }
/* 25 */ }
```

a.  List what goes in each of the blanks:

Q1 _____        Q4 _____

Q2 _____        Q5 _____

Q3 _____        Q6 _____

b.  What is the output after line 14 if the user inputs **Diana** and **27**? (Assume it runs.)

c.  What is the return type of the main method? (circle one)

    There is none          String          public          static          [ ]

d.  What line has a <u>prompt</u> for a decimal input?          _____

e.  In what line is an instance of an object (class) made?          _____

f.  What is the <u>value</u> of age on line 5?          _____

g.  In what line is a method called (***circle all that apply***)          6     8     9     15     18

4) Write a program called `EnergyReaction`.

This program simulates a heat-producing chemical reaction. There are different <u>integer</u> energy values associated with the reaction:

      (1) $E_R$ is reactant energy (reactants are chemicals before the reaction),
      (2) $E_A$ is the added energy (like from a Bunsen burner),
      (3) Maximum energy is $E_R + E_A$
      (4) $E_P$ is product energy (products are chemicals after the reaction),
      (5) Head energy is also a result of the reaction.
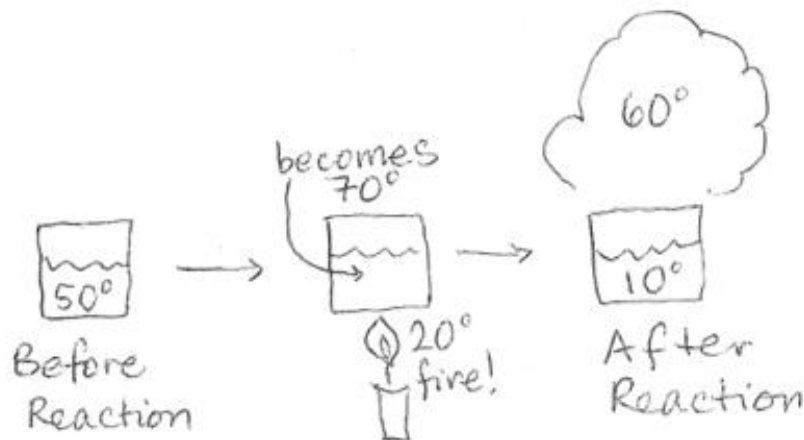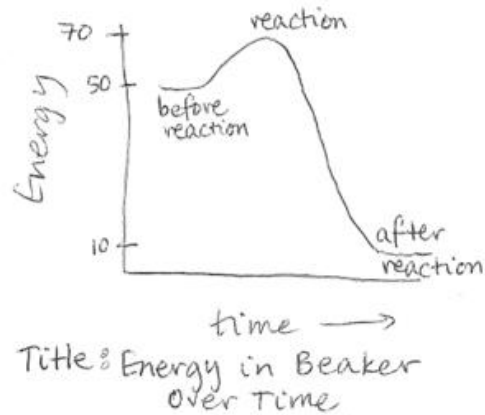




Write a program that collects the integer values $E_R$, Maximum Energy, and $E_P$ as input from the user. Call `calculateDifference()`, a method that returns an energy value based on subtracting a value from the Maximum Energy. In other words:
      energy = maximumEnergy - value

`calculateDifference()` will be used twice, so use parameters so it can be used in these two unique ways:
      Calculate EA by using this equation:
            $E_A$ = Maximum Energy - $E_R$
      Calculate heat using this equation:
            Heat = Maximum Energy - $E_P$

The output in the terminal window should appear in a manner similar to the example below, but should be able to take any appropriate user input (so use variables).

Example output (user input in **bold**):

```
What is the reactant energy (degrees)? 50
What is the maximum energy (degrees)? 70
What is the product energy (degrees)? 10

Your beaker of reactants is 50 degrees. If you heat the beaker by 20 degrees, then
poof - your reaction occurs, and your products will be 10 degrees, and there will
be 60 degrees of heat in the air.
```