First name (color-in initial)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	section (9,10,11, 12,1 or 2)	first name initial	last name initial
Last name (color-in initial)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z			

H13: Due Wednesday, 02.11 in Lecture

More practice with Section 9.1,10.1 and 13.1
Assigned: Mon 02.02 Total Points: 50

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE,
or offered in person, for in person grading, during instructor or TAs office hours.
See the course syllabus at https://foo.cs.ucsb.edu/16wiki/index.php/W15:Syllabus for more details.

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(1) (10 pts) Fill in the information below. Also, fill in the A-Z header by

- **coloring in** the first letter of your first and last name (as it appears in Gauchospace),
- writing **either 9,10,11,12,1 or 2** to indicate your **discussion section (lab)** meeting time
- writing your **first and last initial** in large capital letters.

All of this helps us to manage the avalanche of paper that results from the daily homework.

name:	
umail address:	@umail.ucsb.edu

If you collaborated with AT MOST one other person on this homework, write his/her name below. She/he should also have your name on his/her paper.

Reading: *Re-read sections 9.1, 10.1 on pointers and structs. (If you don't have a copy of the textbook yet, there is one on reserve at the library.)*

Then, answer the following questions. Be sure to check both sides.

2. Using the struct Point declaration shown at the right of this page:

```
struct Point
{
  double x;
  double y;
};
```

   a. (10 pts) Declare an array of struct Point that can hold 5 points.

   b. (10 pts) Write a for loop that assigns the x values of each of the 5 points to the following numbers:

      `0.0, 1.0, 2.0, 3.0, 4.0`

      and that assigns the y value of each point to the x value squared.

      Note that the index of an array should be an integer—so use an int variable to index into the array—but that you can assign an int value to a double variable, and it will be automatically converted into a double.

3. (5 pts) Write a struct definition that is an abstraction of a complex number.

   As a reminder: a complex number is a number of the form $a + bi$, such as $3 + 5i$.

   It has two parts:
   - a real part, represented by a
   - an imaginary part represented by b, which is a real coefficient of i, the square root of -1.

   Your struct definition should be capable of representing complex numbers such as $2.5 + 0.5i$

4. (5 pts) Write a struct definition that is an abstraction of a quadratic equation of the form $f(x) = ax^2 + bx + c$.

   Your abstraction should be able to store the values of a, b and c together in one struct—each of which can be any real number.

5. (10 pts) In the quadratic formula, if the discriminant is negative, then the quadratic equation will have two complex roots, with values as follows:

   $$\frac{-b}{2a} + i\frac{\sqrt{4ac - b^2}}{2a} \quad \frac{-b}{2a} - i\frac{\sqrt{4ac - b^2}}{2a},$$

   where the $-b/2a$ part is the real part, and the other part is the coefficient of the imaginary part.

   Write the definition of a function called firstComplexRoot that:

   - takes, as its parameter, a variable that represents a quadratic equation (use your abstraction from question 3), and
   - returns a value that represents the first of these two roots (the one on the left, with the + sign between the terms), as a complex number (use your abstraction from question 2).

   Keep in mind that both of your struct definitions may have members called a and b—so it will be important to keep track of any use of the letter a refers to a value inside the quadratic equation struct that you passed in to the function, or the a inside the complex value that is being returned.