

HW4—Fixed Quadratic, and Speeding Tickets

10 points

- Assignment:**
1. Improve your HW1 Quadratic Equation solver as described below.
 2. Write a program to calculate speeding ticket fines as described below.

Due: Monday 9/23, 5PM

Turn in: Submit the source files for your two programs using Blackboard Vista.

Program 1—Fixed Quadratics

The quadratic equation solver that you wrote for HW1 had some problems. For example, if the discriminate (part under the radical) is negative, there are no solutions. If you tried this, your program probably crashed.

Enhance your program to first tell the user how many solutions there are. Also, if there are any solutions, tell the user what the solutions are. If there is only one solution, then tell the user only the one solution (don't show the same one twice).

Here are the possibilities:

1. There are no solutions (a and b are both zero).
2. There is one solution (a is zero, b is not zero). (You'll need some algebra to find the formula ...)
3. There are two real solutions (discriminant > 0).
4. There is one solution (discriminant == 0).
5. There are no real solutions (discriminant < 0)

When running your program, make sure to try each of the cases above.

Program 2—Speeding Tickets

The clerks at the county courthouse would like your help computing fines for speeders. The fine for speeding is \$50 plus \$5 for every mph over the speed limit. Additionally, anyone caught driving 90 mph or over pays an extra \$100. Write a program that calculates the fines.

Ask the user for the speed limit, and the driver's speed.

Here are some test cases you should try:

Speed Limit	Driver's Speed	Fine
40	55	\$125
55	97	\$360
55	90	\$325
65	65	\$0
25	28	\$65
45	17	\$0

Use variables for each of the four numbers mentioned in the first paragraph, with meaningful names. That will make it easy to update your program if the speeding laws change.