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AP Computer Science

if Statement Quadratic Program

Write a class for the Quadratic Equation. We want to be able to find the real roots of the equation by using the quadratic formula , the axis of symmetry and the discriminate . Write a program that will utilize the Quadratic class and print all real solutions, the axis of symmetry and the discriminate for input a, b and c values. You should have a toString method that will print the quadratic equation in the form .

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| Step 1: Identify all the (relevant) nouns.  roots  equation  formula  axis  symmetry  discriminate  solutions  program  values | Step 2: Identify the class(es).  QuadraticEquation |
| Step 3: Identify the data members for each of the classes.  double a  double b  double c  double dis | Step 4: Identify the operations for each of the classes. (your verbs)  getSolution1 ()  getSolution2 ()  discriminate ()  axisOfSymmetry ()  toString() |

Implement a class QuadraticEquation whose constructor receives the coefficients a, b, c of a quadratic equation. Supply methods getSolution1 and getSolution2 that get the solutions, using the quadratic formula. You should include a method discriminate() that will compute the discriminate. And a method axisOfSymmetry that will compute the axis of symmetry and return the value. Include a toString method that will return the quadratic written in the form: ax^2 + bx + c.

Writing test data: Give a list of quadratic equations that we should use to test whether or not our program is working correctly. Expand the table as you see fit.

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| Quadratic Equation | Result |
| 2x^2 + 4x + 6 | No solution |
| 1x^2 + 4x + 4 | One solution; -2.0 |
| 2x^2 + 9x + 3 | Two solutions; -0.36254139118231254, -4.1374586088176875 |

Create a main method that will construct Quadratic objects and will print the solutions, discriminate, and axis of symmetry. You should be creating enough Quadratic objects to test your program in all situations.

This planning sheet is 15 points toward your project.