//Jimmy Tran

//AP Comp Sci

//1st Period

//October 2012

public class QuadraticEquation

{

private double a;

private double b;

private double c;

public double dis;

public QuadraticEquation (double coA, double coB, double coC)

{

a = coA;

b = coB;

c = coC;

}

//Solves for the first solution of the Quadratic Equation through addition, if possible. If not, returns NaN.

public double getSolution1 ()

{

return ((-1.0 \* b) + (Math.sqrt((Math.pow(b,2) - 4 \* a \* c)))) / (2 \* a);

}

//Solves for the second solution of the Quadratic Equation through subtraction, if possible. If not, returns NaN.

public double getSolution2 ()

{

return ((-1.0 \* b) - (Math.sqrt((Math.pow(b,2) - 4 \* a \* c)))) / (2 \* a);

}

//Computes the discriminate of the Quadratic Equation.

public double discriminate ()

{

dis = Math.pow(b,2) - (4 \* a \* c);

return dis;

}

//Computes the axis of symmetry of the Quadratic Equation.

public double axisOfSymmetry ()

{

return (-1.0 \* b) / (2 \* a);

}

//Returns the Quadratic Equation in the format ax^2 + bx + c.

public String toString()

{

return ("The Quadratic Formula is: " + a + "x^2 + " + b + "x + " + c);

}

}

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import java.util.Scanner;

public class QuadraticEquationRunner

{

public static void main(String[]args)

{

//Sets the keyboard as the input device.

Scanner keyboard = new Scanner(System.in);

double a, b, c, calc;

//Asks for "a" in the Quadratic Formula.

System.out.println("What is the coefficient of x^2?");

a = keyboard.nextDouble();

//Asks for "b" in the Quadratic Formula.

System.out.println("What is the coefficient of x?");

b = keyboard.nextDouble();

//Asks for "c" in the Quadratic Formula.

System.out.println("What is the number without a variable?");

c = keyboard.nextDouble();

//Creates a Quadratic Equation with given a, b, and c.

QuadraticEquation QuadTest = new QuadraticEquation (a,b,c);

//Prints out the toString of the QuadraticEquation class.

System.out.println(QuadTest);

//Returns the discriminate.

System.out.println("Your discriminate is " + QuadTest.discriminate() + ".");

//Returns number of solutions.

if (QuadTest.dis > 0)

{

System.out.println ("You have two solutions.");

System.out.println("Your solution through addition is " + QuadTest.getSolution1() + ".");

System.out.println("Your solution through subtraction is " + QuadTest.getSolution2() + ".");

}

else

{

if (QuadTest.dis == 0)

{

System.out.println ("You have one solution.");

if (QuadTest.getSolution1() == QuadTest.getSolution2())

{

System.out.println("Your solution is " + QuadTest.getSolution1() + ".");

}

}

else

{ System.out.println ("You have no solution."); }

}

//Returns axis of symmetry.

System.out.println("Your axis of symmetry is " + QuadTest.axisOfSymmetry() + ".");

}

}