

Graphing Calculator Comp. Sci.

```
var realSolutions;
var x1;
var x2;

onEvent("calculateButton", "click", function() {
    compute();
    display(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));
});

onEvent("graphButton", "click", function() {
    compute(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));
    graph(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));
});

onEvent("backButton", "click", function() {
    setScreen("homeScreen");
});

function compute() {
    findRealSolutions(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));
    solveForX(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));
}

function display(a, b, c) {
    setRealSolutionsText();
    displayAnswers();
    displayVertex((-b) / (2 * a), (a * Math.pow((-b) / (2 * a), 2) + b * (-b) / (2 * a) + c))
}

function graph(a, b, c) {
    setScreen("graphScreen");
    graphParabola(getNumber("aInput"), getNumber("bInput"), getNumber("cInput"));

    if (a == 0 && c == 0) {
        for (var i = 1; i < 33; i++) {
            setProperty("pixel" + i, "icon-color", "green");
        }
        setText("graphText", "The equation is linear and goes through the origin!");
    } else if (a == 0) {
        for (var p = 1; p < 33; p++) {
            setProperty("pixel" + p, "icon-color", "yellow");
        }
        setText("graphText", "The equation is linear!");
    } else {
        setText("graphText", "The equation is quadratic!");
    }
}

function displayVertex(x, y) {
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    setText("vertexOutput", "Vertex =" + "\n" + "(" + x + ", " + y + ")");
}

function solveForX(a, b, c) {
    x1 = (-b + Math.sqrt(Math.pow(b, 2) + (-4 * a * c))) / (2 * a);
    x2 = (-b - Math.sqrt(Math.pow(b, 2) + (-4 * a * c))) / (2 * a);
}

function findRealSolutions(a, b, c) {
    if (Math.pow(b, 2) - (4 * a * c) > 0) {
        realSolutions = 2;
    } else if (Math.pow(b, 2) - (4 * a * c) < 0) {
        realSolutions = 0;
    } else {
        realSolutions = 1;
    }
}

function displayAnswers() {
    if (realSolutions == 1) {
        setText("rootsOutput", "X=" + x1);
    } else if (x1 != x2 && realSolutions == 2) {
        setText("rootsOutput", "X=" + x1 + "\n" + "X=" + x2);
    } else {
        setText("rootsOutput", "");
    }
}

function setRealSolutionsText() {
    if (realSolutions == 0 || realSolutions == 2) {
        setText("numberOfRealSolutions", "There are " + realSolutions + " real solutions");
    } else {
        setText("numberOfRealSolutions", "There is 1 real solution");
    }
}

function graphParabola(a, b, c) {
    for (var x = 1; x < 33; x++) {
        var y = ((a * (Math.pow((x - 15), 2))) + (b * ((x - 15)))) + (c));
        setPosition("pixel" + (x), (10 * x) - 10, (-10 * y) + 232, 10, 10);
    }
}

onEvent("trigButton", "click", function() {
    setScreen("trigScreen");
});

onEvent("calculateTrigButton", "click", function() {
    sinCalc(getNumber("aSinValue"), getNumber("kSinValue"), getNumber("bSinValue"), getNumber("amplitudeText"), "Amplitude = " + getAmplitude());
    setText("periodText", "Period = " + getPeriod() + "π");
});

onEvent("graphScreenButton", "click", function() {

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104     setScreen("trigGraphScreen");
105     sinCalc(getNumber("aSinValue"), getNumber("kSinValue"), getNumber("bSinValue"), getNumber
106     graph1());
107 });
108
109 var y = [];
110
111 function sinCalc(aSin, kSin, bSin, cSin) {
112     y = [];
113     for (var x = 1; x < 33; x++) {
114         appendItem(y, (aSin * (Math.sin(kSin * (((Math.PI / 4) * x) + (Math.PI / 2 * bSin))))
115     }
116 }
117
118 function graph1() {
119     for (var x = 1; x < 33; x++) {
120         setPosition("image" + (x), (10 * x) - 10, (-10 * y[x - 1]) + 225, 10, 10);
121     }
122 }
123
124 onEvent("backButton2", "click", function() {
125     setScreen("trigScreen");
126 });
127
128 function getAmplitude() {
129     var amplitude = getNumber("aSinValue");
130     return amplitude;
131 }
132
133 function getPeriod() {
134     var period = (((2 * Math.PI) / getNumber("kSinValue")) / Math.PI);
135     return period;
136 }
137
138 onEvent("backButton1", "click", function() {
139     setScreen("homeScreen");
140 });
```