Solving 2x2 Systems of Equations   **For the Teacher**
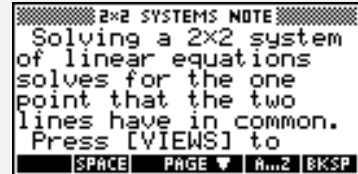
Objectives:
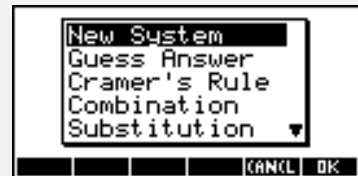
Using the **2x2 SYSTEMS** aplet, the student will solve systems of linear equations using substitution, linear combination, and Cramer's Rule.

Functionality:

When the student presses **START** , the
2x2 SYSTEM NOTE will be displayed.

 VIEWS allows the student to enter a new system to be solved, to guess the answer, and to see how to solve the system using Cramer's rule, combination, or substitution.
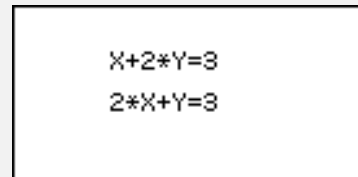
 New System prompts the student to enter the coefficients and constants for the system
$$Ax + By = C$$
$$Dx + Ey = F$$

Once the student has entered the coefficients and constants, the system is displayed.

 Guess Answer prompts the student to enter the x- and y-coordinate of the solution to the system.

A message box is then displayed detailing the correctness of the student's entry.

Cramer's Rule will first prompt the student to solve for x or y.

```
░░░░░░░░ Y-COORDINATE ░░░░░░░░
   ░░░ CRAMER'S RULE ░░░
  Solve for X            ■
  Solve for Y
ENTER Y-COORDINATE OF SOLUTION
                      CANCL OK
```

After selecting the variable to solve for, the steps will be displayed. The screen is frozen between steps; press any key to see the next step.

$$X = \frac{\begin{vmatrix} 3 & 2 \\ 3 & 1 \end{vmatrix}}{\begin{vmatrix} 1 & 2 \\ 2 & 1 \end{vmatrix}} = \frac{3-6}{1-4} = \frac{-3}{-3}$$
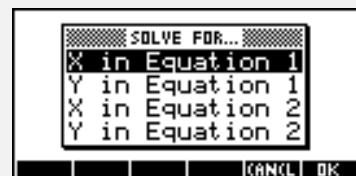
Combination will first display the system and then prompt the student to enter the factors to multiply through each equation.

```
░░░░░░░░░ EQUATION 1 ░░░░░░░░░
FACTOR=    1
ENTER FACTOR FOR EQUATION 1
EDIT                  CANCL OK
```

After selecting the factors, the steps will be displayed. The screen is frozen between steps; press any key to see the next step.

```
1  (X+2*Y=3)
-2 (2*X+Y=3)

X+2*Y=3
-(4*X)-2*Y=-6

-(3*X)=-3      X=1
               Y=1
```

Substitution will first prompt the student to select which variable to solve and for an equation.

```
░░░░░░░ SOLVE FOR... ░░░░░░░
 X in Equation 1
 Y in Equation 1
 X in Equation 2
 Y in Equation 2
                   CANCL OK
```

After these selections have been made, the steps will be displayed. The screen is frozen between steps; press any key to see the next step.

```
X=3-2*Y
2*X+Y=3

 2*(3-2*Y)+Y=3
 -(3*Y)=-3
 Y=1        X=3-2*Y
            X=1
                   CANCL OK
```

Ideas can be applied to:
  Algebra I, Algebra II, Precalculus

Programs associated with this aplet:
  .SEQ.LN, .SEQ.SOL, .SEQ.SB, .SEQ.NP, .SEQ.GA, .SEQ.CR, .SEQ.LC, .SEQ.SV