Cramer's Rule for Two Equations

Name _____

Date _____ Period _____

When given a system of equations,

$$ax + by = e$$
$$cx + dy = f$$

We can create a coefficient matrix from the coefficients of the variables.

$$\det\begin{bmatrix} a & b \\ c & d \end{bmatrix} = D$$

When given a system of equations,

$$ax + by = e$$
$$cx + dy = f$$

both equations in standard form

has solutions, $x = \dfrac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{D}$ and $y = \dfrac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{D}$

D = determinant of the coefficient matrix

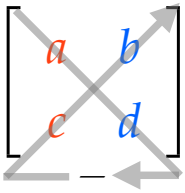
This is knows as Cramer's Rule for Two Equations

Steps to Use Cramer's Rule

1. Put equations in standard form...

$$ax + by = e$$
$$cx + dy = f$$

2. Create a coefficient matrix



3. Find determinant of coefficient matrix

Set = D

4. Calculate value of x.

$$x = \frac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{D}$$

5. Calculate value of y.

$$y = \frac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{D}$$

Use Cramer's Rule to solve the following system of equations

$$2x + 2y = -2$$
$$3x + 4y = -5$$

Use Cramer's Rule to solve the following system of equations

$$x + y = 9$$
$$3x - y = 3$$

Use Cramer's Rule to solve the following system of equations

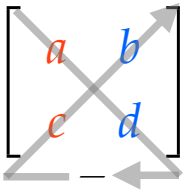
$$3x - 9 = 3y$$
$$y = 2x + 1$$

Steps to Use Cramer's Rule

1. Put equations in standard form...

$$ax + by = e$$
$$cx + dy = f$$

2. Create a coefficient matrix



3. Find determinant of coefficient matrix

Set = D

4. Calculate value of x.

$$x = \frac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{D}$$

5. Calculate value of y.

$$y = \frac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{D}$$