When given a system of equations,

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

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

$$\det \left[\begin{array}{cc} a & b \\ c & d \end{array} \right] = D$$

Then the system of equations,

$$ax + by = e$$

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

D = determinant of the coefficient matrix This is knows as Cramer's Rule for Two Equations

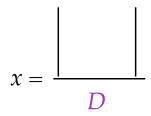
Cramer's Rule

1. Put System of Equations in Form...

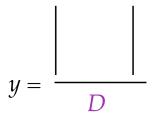
$$ax + by = e$$
$$cx + dy = f$$

- 2. Find Coefficient Matrix
- 3. Find Determinant of Coefficient Matrix

4. Calculate value of x.



5. Calculate value of *y*.



Use Cramer's Rule to solve the following system

$$3x - 6y = 24$$
$$5x + 4y = 12$$

Cramer's Rule

$$ax + by = e$$

$$cx + dy = f$$

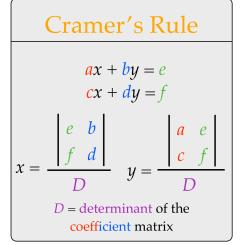
$$x = \frac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{D} \quad y = \frac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{D}$$

$$D = \text{determinant of the}$$

$$\text{coefficient matrix}$$

Use Cramer's Rule to solve the following system

$$x + 2y = 8$$
$$3x - 5y = -9$$



Cramer's Rule

1. Put System of Equations in Form...

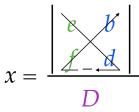
$$ax + by = e$$
$$cx + dy = f$$

2. Find Coefficient Matrix



3. Find Determinant of Coefficient Matrix Set = D

4. Calculate value of x.



5. Calculate value of *y*.

$$y = \frac{\left| \underbrace{x} \right|}{D}$$