Turning a system of two equations into an augmented matrix.

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

$$-x + 3y = 4$$

$$-2x = 10$$

$$x + y = 8$$

$$5x + y = -14 \qquad x - y = 6$$

$$x - y = 6$$

Row Operations can be performed on each row to manipulate the values in each row.

Three Row Operations

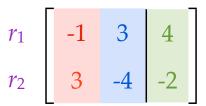
- 1. Interchange any two rows.
- 2. Replace a row by a nonzero multiple of that row.
- 3. Replace a row by the sum of that row and a constant nonzero multiple of some other row.

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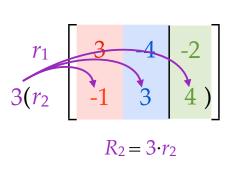
r_1	3	-4	-2
r_2	-1	3	4

interchange r_1 with r_2



Three Row Operations

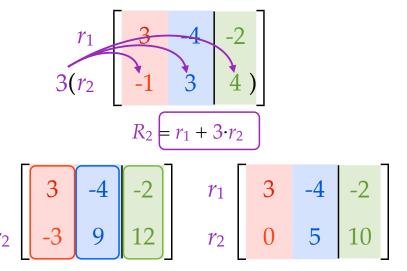
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$$r_1$$
 $\begin{bmatrix} 3 & -4 & -2 \\ -3 & 9 & 12 \end{bmatrix}$

Three Row Operations

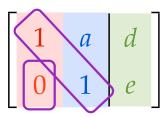
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Row Echelon Form



create a diagonal of 1's with 0's under the 1's Use *a*, *d*, and *e* to solve for our *x* and *y* variables.

Solve the following

$$-3x + 5y = -4$$
$$x - 2y = 7$$

Solve the following

$$-2x - 3y = 14$$
$$-x - 2y = 9$$

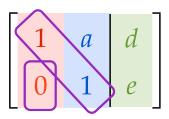
Solve the following

$$3x + 6y = 12$$
$$x + 2y = 4$$

Three Row Operations

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Row Echelon Form



create a diagonal of 1's with 0's under the 1's Use *a*, *d*, and *e* to solve for our *x* and *y* variables.