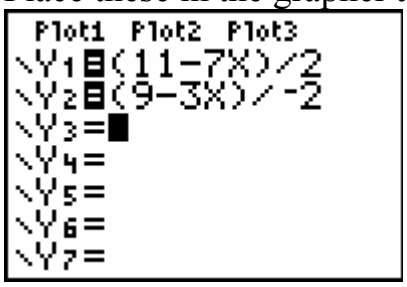
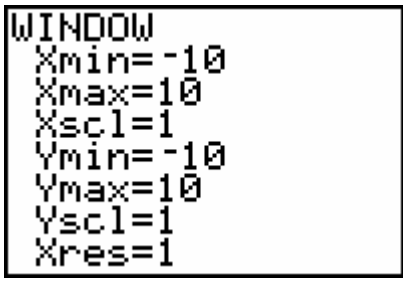
Algebra II
The 7 Ways – Chapter 7

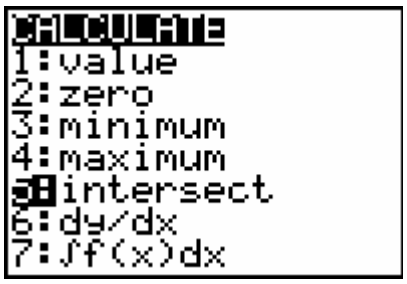
For the system of equations:
$7x + 2y = 11$
$3x - 2y = 9$

Graph-Intersect
Solve each equation for y.
This can be done with a stick or in TII [solve (7x+2y=11,y)]
Place these in the grapher and set a WINDOW:





Locate the Intersection.



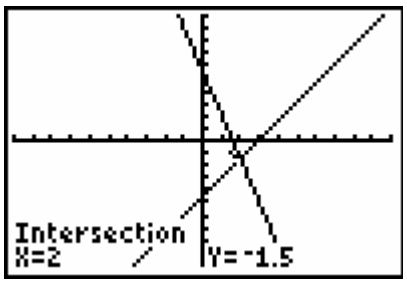
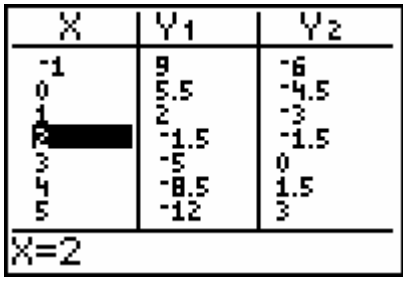


Table
Set the Table and then reset as needed to find the location.



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Substitution

Solve one of the equations for one of the variables, and then substitute that into the other equation.

$7x + 2y = 11$

$7x - 7x + 2y = 11 - 7x$

$\frac{2y}{2} = \frac{11 - 7x}{2}$

$y = \frac{11 - 7x}{2}$

$3x - 2y = 9$

$3x - 2(\frac{11 - 7x}{2}) = 9$

$3x - 11 + 7x = 9$

$10x - 11 = 9$

$10x - 11 + 11 = 9 + 11$

$10x = 20$

$\frac{10x}{10} = \frac{20}{10}$

$x = 2$

Then substitute that value into one of the original equations.

7x+2y=11
7(2)+2Y=11
14+2Y=11
14-14+2Y =11-14
2Y=-3
Y= -3/2 = -1.5

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Matrix

Set up the equations in this form:

Ax + By = C

Dx + Ey = F

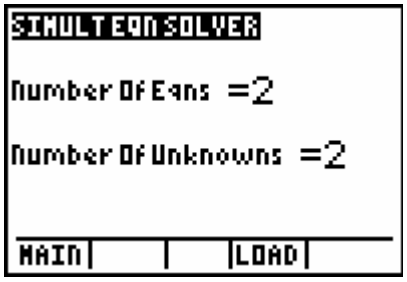
Then place the values in a matrix of the form:

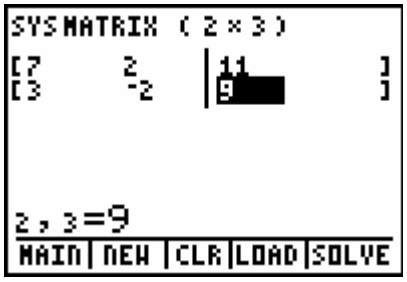
$[A]=\begin{pmatrix} A & B \\ D & F \end{pmatrix}$ $[B]=\begin{pmatrix} C \\ F \end{pmatrix}$ using the operation $[A]^{-1}*[B] = \begin{pmatrix} x \\ y \end{pmatrix}$

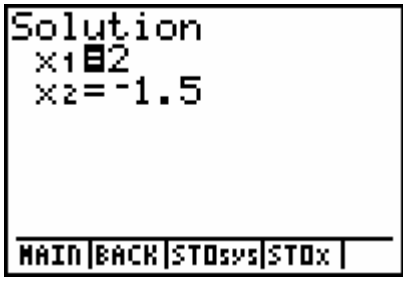
So we have $\begin{pmatrix} 7 & 2 \\ 3 & -2 \end{pmatrix}^{-1} * \begin{pmatrix} 11 \\ 9 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ -1.5 \end{pmatrix}$

PolySmlt APP

Run the APP and install the appropriate the values and then solve.







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TII

$\text{solve}(7 \cdot x + 2 \cdot y = 11 \text{ and } 3 \cdot x - 2 \cdot y = 9, x)$

$x = 2 \text{ and } y = \frac{-3}{2}$

Elimination

Line up the equations and either add or subtract the equations to eliminate one of the variables. Sometimes you will need to multiply one or both equations to make the constants the same or opposite.

$7x + 2y = 11$
(+) $3x - 2y = 9$

$10x + 0 = 20$ and then $x = 2$

Substitute the value into one of the original equations and then solve.