

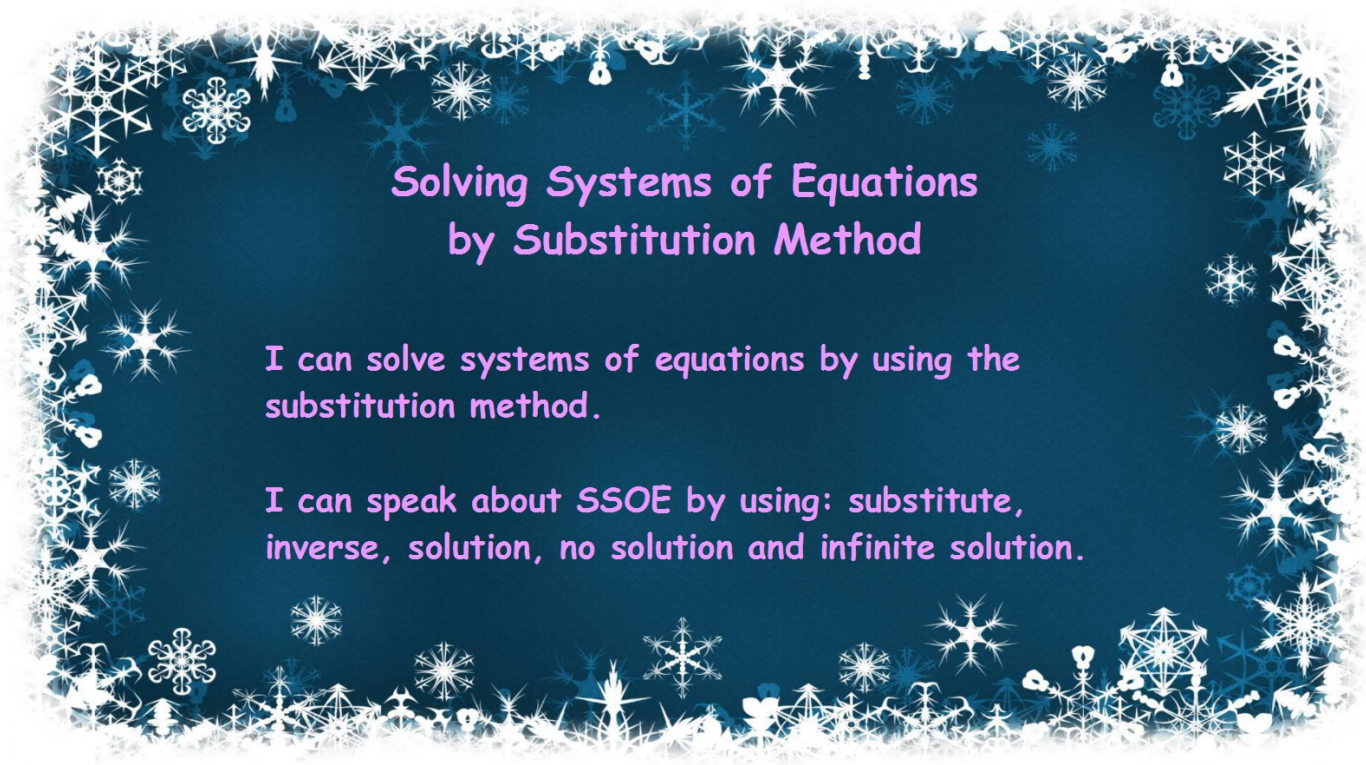
Wednesday 12/4

The data displays the population since 1940.

	0	5	10	15	20	25	30	35	40	45
Year	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985
Pop	30.5	24.5	23.1	19.2	15.6	12.4	9.7	8.9	7.2	4.2

What is the regression equation of the data above?

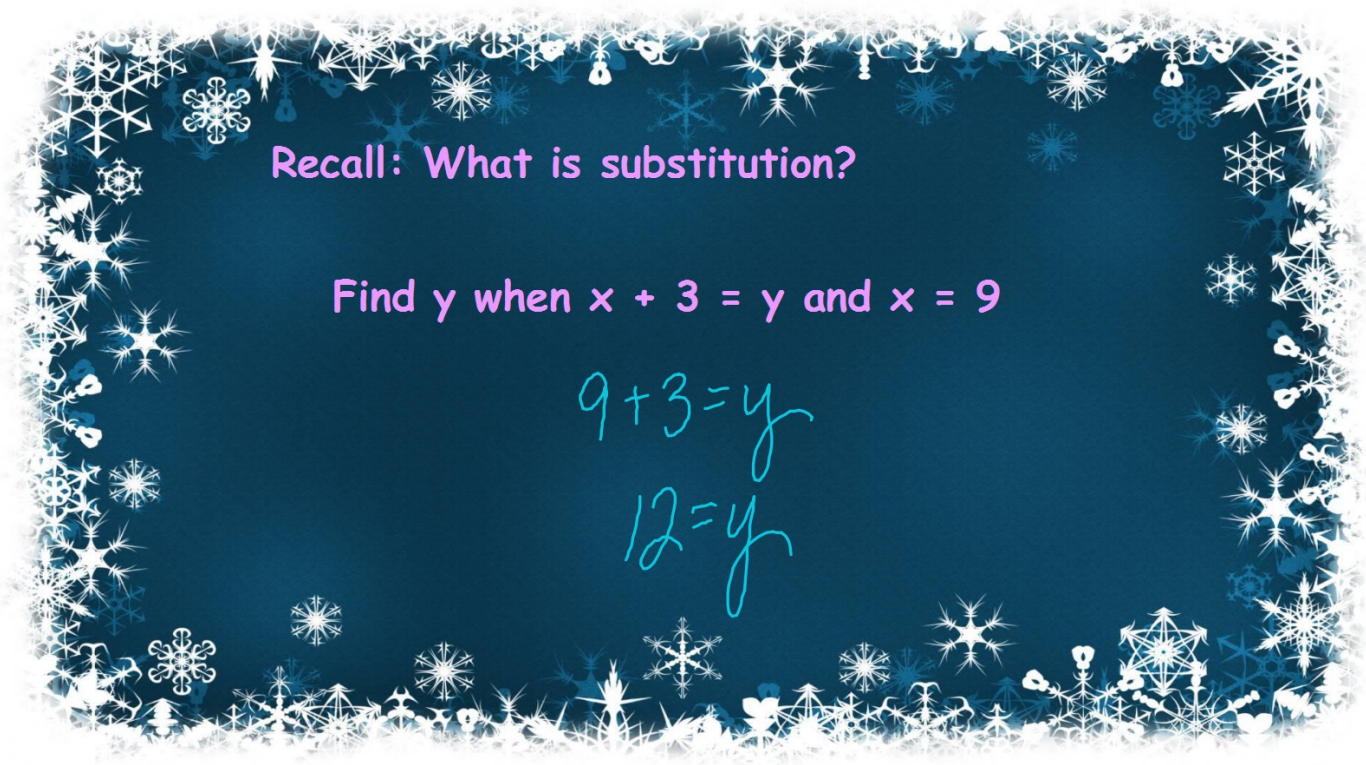
$$y = -.56x + 28.09$$



Solving Systems of Equations by Substitution Method

I can solve systems of equations by using the substitution method.

I can speak about SSOE by using: substitute, inverse, solution, no solution and infinite solution.



Recall: What is substitution?

Find y when $x + 3 = y$ and $x = 9$

$$9 + 3 = y$$

$$12 = y$$

$$x=4$$

$$f(4) = x - 14$$

$$f(4) = 4 - 14$$

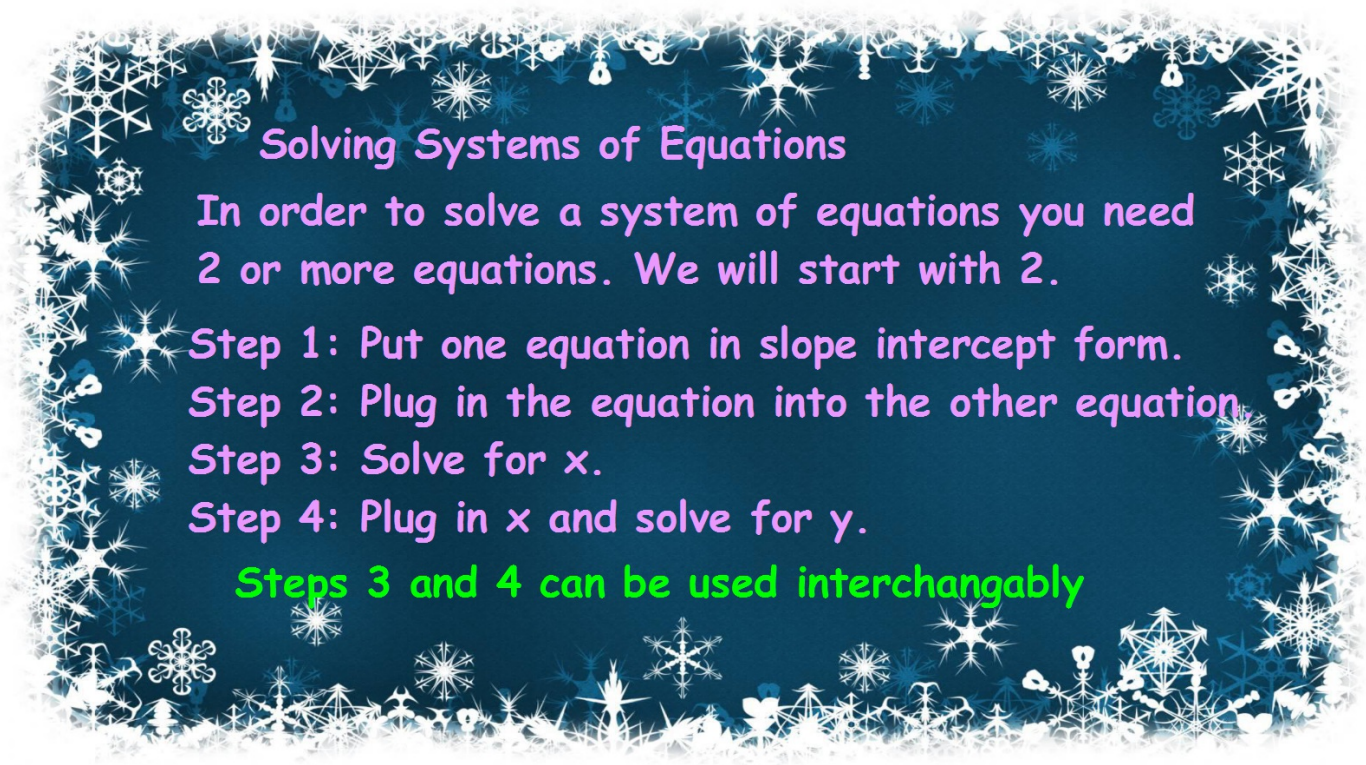
$$f(4) = -10$$

$$f(x) = \frac{1}{4}x + 2, f(x) = 10$$

$$10 = \frac{1}{4}x + 2$$

$$\frac{10 - 2}{4} = \frac{1}{4}x$$

$$32 = x$$



Solving Systems of Equations

In order to solve a system of equations you need 2 or more equations. We will start with 2.

Step 1: Put one equation in slope intercept form.

Step 2: Plug in the equation into the other equation.

Step 3: Solve for x .

Step 4: Plug in x and solve for y .

Steps 3 and 4 can be used interchangeably

$$\begin{aligned} 3x + y &= 5 \\ 5x - 4y &= -3 \end{aligned}$$

$$\begin{array}{r} 3x + y = 5 \\ -3x \quad -3x \\ \hline \end{array}$$

$$y = -3x + 5$$

$$y = -3(1) + 5$$

$$y = -3 + 5$$

$$y = 2$$

$$\begin{aligned} 5x - 4(-3x + 5) &= -3 \\ 5x + 12x - 20 &= -3 \end{aligned}$$

$$\begin{array}{r} 17x - 20 = -3 \\ +20 \quad +20 \\ \hline \end{array}$$

$$\frac{17x}{17} = \frac{17}{17}$$

$$x = 1$$

Solution
(1, 2)

$$\begin{array}{r} -3x - 3y = 3 \\ 5x + y = -17 \\ \hline -5x \qquad -5x \\ \hline y = -5x - 17 \end{array}$$

$$\begin{aligned} y &= -5(-4) - 17 \\ y &= 20 - 17 \\ y &= 3 \end{aligned}$$

Solution $(-4, 3)$

$$-3x(-3)(-5x-17)=3$$

$$(-3x)(+15x) + 51 = 3$$

$$\begin{array}{r} 12x + 51 = 3 \\ -51 \quad -51 \\ \hline \end{array}$$

$$\frac{12x}{12} = \frac{-48}{12}$$

$$x = -4$$

$$\begin{aligned} -4x + y &= 6 \\ -5x - y &= 21 \end{aligned}$$

$$\begin{array}{r} -4x + y = 6 \\ +4x \quad +4x \\ \hline y = 4x + 6 \end{array}$$

$$y = 4(-3) + 6$$

$$y = -12 + 6$$

$$y = -6$$

$$-5x - (4x + 6) = 21$$

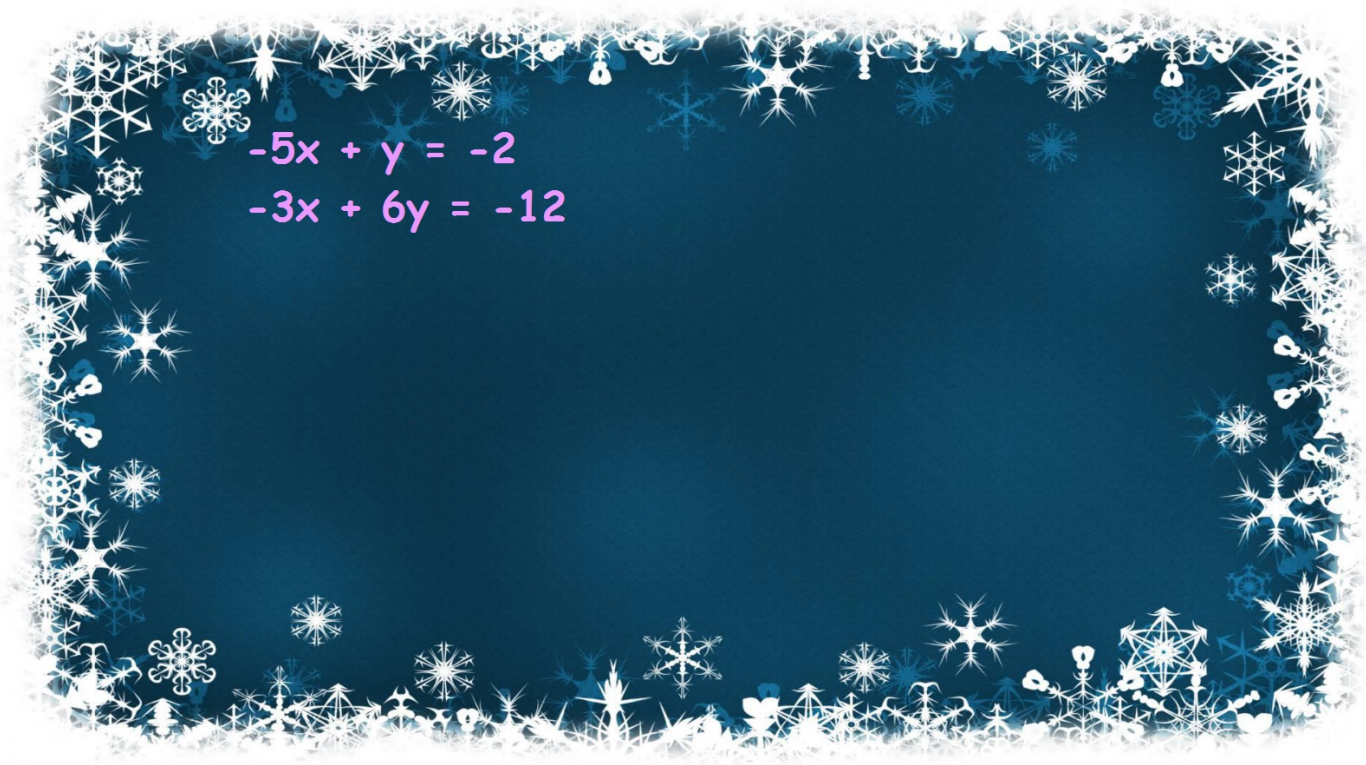
$$-5x - 4x - 6 = 21$$

$$\begin{array}{r} -9x - 6 = 21 \\ +6 \quad +6 \\ \hline -9x = 27 \end{array}$$

$$\frac{-9x}{-9} = \frac{27}{-9}$$

$$x = -3$$

Solution: $(-3, -6)$


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

$$-3x + 6y = -12$$