

October 3rd, 2007

Solve by Elimination

Ex : $3x + 2y = 10$
 $y = 6x - 10$

Step 1: line up x 's, y 's, $=$'s, $\#$'s

$$\begin{array}{r} 3x + 2y = 10 \\ -6x + y = -10 \end{array}$$

Step 2: (multiplication) to eliminate variable by making coefficients the same (x OR y)

$$\begin{array}{r} 6x + 4y = 20 \\ + \\ -6x + y = -10 \end{array}$$

different sign \rightarrow add
same sign \rightarrow subtract

$$\begin{array}{r} 5y = 10 \\ \frac{5y}{5} = \frac{10}{5} \\ y = 2 \end{array}$$

Step 3: sub variable back into an original equation

$$\begin{array}{r} -6x + y = 10 \\ -6x + 2 = -10 \\ -6x = -12 \\ \frac{-6x}{-6} = \frac{-12}{-6} \quad x = 2 \end{array} \quad \therefore (2, 2)$$

Ex. 2: $2x = 3y + 4$
 $6 - 5x + 2y = 0$

Step 1: $2x - 3y = 4$
 $-5x + 2y = -6$

Step 2: $+ 10x - 15y = 20$
 $-10x + 4y = -12$

 $-11y = 8$

$$y = -\frac{8}{11}$$

Step 3: sub $y = -\frac{8}{11}$ into $2x = 3y + 4$

$$2x = 3y + 4$$

$$2x = 3\left(-\frac{8}{11}\right) + 4$$

$$2x = -\frac{24}{11} + 4$$

$$2x = \frac{20}{11}$$

$$x = \frac{10}{11}$$

$$\therefore \left(\frac{10}{11}, -\frac{8}{11}\right)$$

Ex 3: $\frac{3}{8}x + \frac{18}{11}y = \frac{15}{6}$

$$-\frac{1}{3} + \frac{1}{4}y = -\frac{1}{6}x$$

Step 1: $\frac{3}{8}x + \frac{18}{11}y = \frac{15}{6}$

$$\frac{1}{6}x + \frac{1}{4}y = \frac{1}{3}$$

Step 2: One Way

$$3x + \frac{144}{11}y = 20$$

$$- \quad 3x + \frac{9}{5}y = 6$$

$$\frac{189}{22}y = 14$$

$$y = \frac{144}{27}$$

$$x = -\frac{4}{9}$$

Second Way

$$198x + 864y = 1320$$

$$2x + 3y = 4$$

$$- \quad 198x + 864y = 1320$$

$$198x + 297y = 396$$

$$567y = 924$$

$$y =$$

