

8 pumpkin cookies and 15 ghost cookies for \$31.25.

8 pumpkin cookies and 5 ghost cookies for \$23.75.

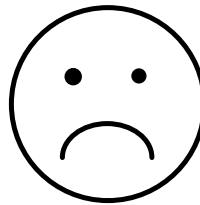
What is the price of each one of the cookies?



$$\begin{cases} 8x + 15y = 31.25 \\ 8x + 5y = 23.75 \end{cases}$$

$$\begin{cases} 15y = 31.25 - 8x \\ 5y = 23.75 - 8x \end{cases}$$

$$\begin{cases} y = \frac{31.25 - 8x}{15} \\ y = \frac{23.75 - 8x}{5} \end{cases}$$



Solving by elimination:

If we have a system with lines in general form:

$$\begin{cases} ax+by=c \\ ax+by=c \end{cases} \quad \text{OR} \quad \begin{cases} ax+by+c=0 \\ ax+by+c=0 \end{cases}$$

It is easiest to solve by **elimination**.

Steps: 1. Multiply each equation by a number, such that one of the variables has the same, but opposite coefficient.

2. Add the equations.

3. Solve for the remaining variable.

4. Replace the answer in either equation to find the second variable.

- To check, replace it in the second equation

5. Write solution as a point (x,y).

ex.1: $\begin{cases} x-y=10 \\ x+y=14 \end{cases}$

$$\begin{array}{r} 2x+0=24 \\ \hline 2 \quad 2 \\ x=12 \end{array}$$

$$\begin{array}{r} x-y=10 \\ 12-y=10 \\ y=2 \end{array}$$

Ans: (12, 2)

ex.2: $\begin{cases} 4x+3y=2 \\ 8x+y=14 \end{cases}$

$$\begin{array}{r} -8x-6y=-4 \\ + \quad 8x+y=14 \\ \hline -5y=10 \\ -5y=10 \quad \cdot (-1) \\ y=-2 \end{array}$$

$$\begin{array}{r} 4x+3y=2 \\ 4x+3(-2)=2 \\ 4x-6=2 \quad +6 \\ 4x=8 \\ \frac{4}{4} \quad \frac{8}{4} \\ x=2 \end{array}$$

(2, -2)

ex.3: $\begin{cases} 3x+2y=7 \\ 5x-7y=-9 \end{cases}$

$$\begin{array}{r} 3x+2y=7 \\ 3x+2(2)=7 \\ 3x+4=7 \quad \cdot (-1) \\ 3x=-3 \\ \frac{3}{3} \quad \frac{-3}{3} \\ x=-1 \end{array}$$

(-1, 2)

$$\begin{array}{r} -15x-10y=-35 \\ 15x-21y=-27 \\ \hline 0-31y=-62 \\ -31y=-62 \quad \cdot (-1) \\ y=2 \end{array}$$