

Solve the following system of equations:

$$\begin{aligned}2x - 3y &= -15 \\ x &= 1.5y + 12\end{aligned}$$

by substitution

$$2(1.5y + 12) - 3y = -15$$

$$3y + 24 - 3y = -15$$

$$24 = -15 \quad \text{False}$$

No solution!

When a solution is not possible, this means that the two lines are parallel and distinct.

Solve the following system of equations:

$$20x - 12y = 48$$

$$6y - 10x = -24$$

By elimination

$$20x - 12y = 48$$

$$-10x + 6y = -24 \quad | \times 2$$

$$\begin{array}{r} 20x - 12y = 48 \\ -20x + 12y = -48 \\ \hline \end{array}$$

$0 = 0$  Infinite number  
of solutions!

When the system reduces to  $0 = 0$ , this means the two lines are parallel and coincident (i.e., they are the same line).

Julie, Karina and Veronica made heart-shaped paper clips in two sizes: small and large.

To do so, they cut pieces of wire into two different lengths.

- \* To make 14 small paper clips and 7 large paper clips, Julie used a total length of 392 cm of wire.
- \* To make 6 small paper clips and 8 large paper clips, Karina used a total length of 278 cm of wire.
- \* Veronica made 11 small paper clips and 3 large paper clips.

What is the total length of wire that Veronica used?

①  $x$ : length in small pc's  
 $y$ : length in large pc's

$$6x + 8(22) = 278$$

$$6x + 176 = 278$$

$$6x = 102$$

$$x = 17$$

check:  $14(17) + 7(22) = 392$

$$(392) = 238 + 154 = 392$$

②  $3(14x + 7y = 392)$

$-7(6x + 8y = 278)$

$$42x + 21y = 1176$$

$$+ -42x - 56y = -1946$$

$$-35y = -770$$

$$-35 \quad -35$$

$$y = 22$$

④  $11(17) + 3(22)$   
 $187 + 66$   
253cm

③ solve the system  
 6, 14 LCM = 42