

Lesson 13: Solving (a system of equations)
a group
(2 equations)

Recall:

Solve "find the value of the unknown"

$$x + \cancel{5} = 50 - \cancel{5}$$

$$x = 45$$

Riddle:
The ^xage of the
principal plus
five is 50.
\$ =

SOLVING AN EQUATION WITH ONE UNKNOWN

Example: You spent 10\$ on five bananas. If your friend has 11\$ and wants to buy six bananas, does he have enough money?

$$x = \$ \text{ per banana}$$

$$5x = 10$$

$$5x \cdot 3 = 15 \quad \leftarrow \text{total cost}$$

of bananas \nearrow
cost per banana \uparrow

$$\cancel{5}x = \frac{10}{\cancel{5}}$$

$$x = 2 \text{ \$ per banana}$$

Step i. Define the unknown (x).
Tip: pick an x that's related to given info.
Step ii Construct an equation using x .
TIP: Do a case scenario w numbers.
Step iii solve w o.o.
Step iv Label final answer and answer question.

$$TC = c \text{ per } x \text{ \# of banana}$$

$$TC = \$ 2 \times 6 \text{ banana}$$

$$TC = 12 \$ > 11 \$$$

\therefore friend doesn't have enough.

Determining the value of 2 unknowns

You spent \$16 on 3 apples and 2 oranges.
How much did each cost individually?

$$x = \$ \text{ per apple}$$

$$y = \$ \text{ per orange}$$

$$3x + 2y = 16$$

→ ~~can't~~ can't solve
 cuz there are
 2 unknowns
 (need a 2nd equation)

Determining the Value of 2 Unknowns Graphically

nota bene: the solution is the point of intersection.

$$y = ax + b \quad \begin{matrix} \nearrow \text{slope} \\ \text{---} y\text{-int} \end{matrix} = \frac{\text{rise}}{\text{run}}$$

$$y = \frac{3}{2}x + 2 \quad l_1$$

Step i.
isolate
y

$$3x + 2y = 16 \quad -3x \quad l_2$$

$$2y = -3x + 16$$

$$y = -\frac{3}{2}x + 8$$

Step ii: pick values of x and sub in equation to find y.

x	y
0	8
2	5

$$x = 0$$

find y

$$y = -\frac{3}{2}(0) + 8$$

$$y = 8$$

if to find

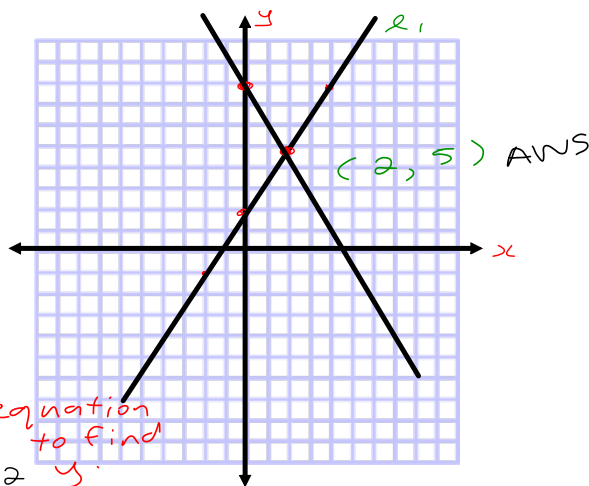
$$x = 2$$

find y

$$y = -\frac{3}{2}(2) + 8$$

$$y = -3 + 8$$

$$y = 5$$



Determining the Value of 2 Unknowns algebraically using elimination

Solve:

$$(30x + 5y) = (355) \quad \textcircled{1} \times 3$$

$$(45x + 3y) = (510) \quad \textcircled{2} \times 5$$

$$90x + 15y = 1065 \quad \textcircled{1}$$

$$225x + 15y = 2550 \quad \textcircled{2}$$

$$\begin{array}{r} - \\ \hline -135x = -1485 \\ \hline -135 \\ \hline x = 11 \end{array} \quad \textcircled{1} - \textcircled{2}$$

$$30x + 5y = 355 \quad \textcircled{1}$$

$$30(11) + 5y = 355$$

$$330 + 5y = 355 \quad \textcircled{1} \text{ sub in } x=11 \text{ (evaluate)}$$

$$5y = \frac{25}{5} \quad y = 5 \quad \therefore \text{Answer } (11, 5)$$

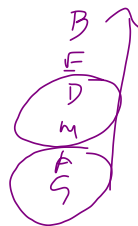
step i: identify variable with lowest coefficients.

and times each equation by other coefficient.

step ii: Add or subtract equations to eliminate one variable.

step iii: solve for x with 0.0.

step iv: sub in value of x into $\textcircled{1}$ and solve for y with 0.0.



- HWK: P 156 #7
- Pg 153 #3
- Pg 128 #2
- Pg 132 #5
- Pg 132 #6
- x y

P144 #3