Which method would be the easiest to use on the following problems?

1. $y = 5x - 6$
   $y = 4x - 6$
   graph

2. $x = 2y$
   $2x - 3y = 3$
   Sub.

3. $2x + 5y = 7$
   $4x - 6y = -2$
   elimination

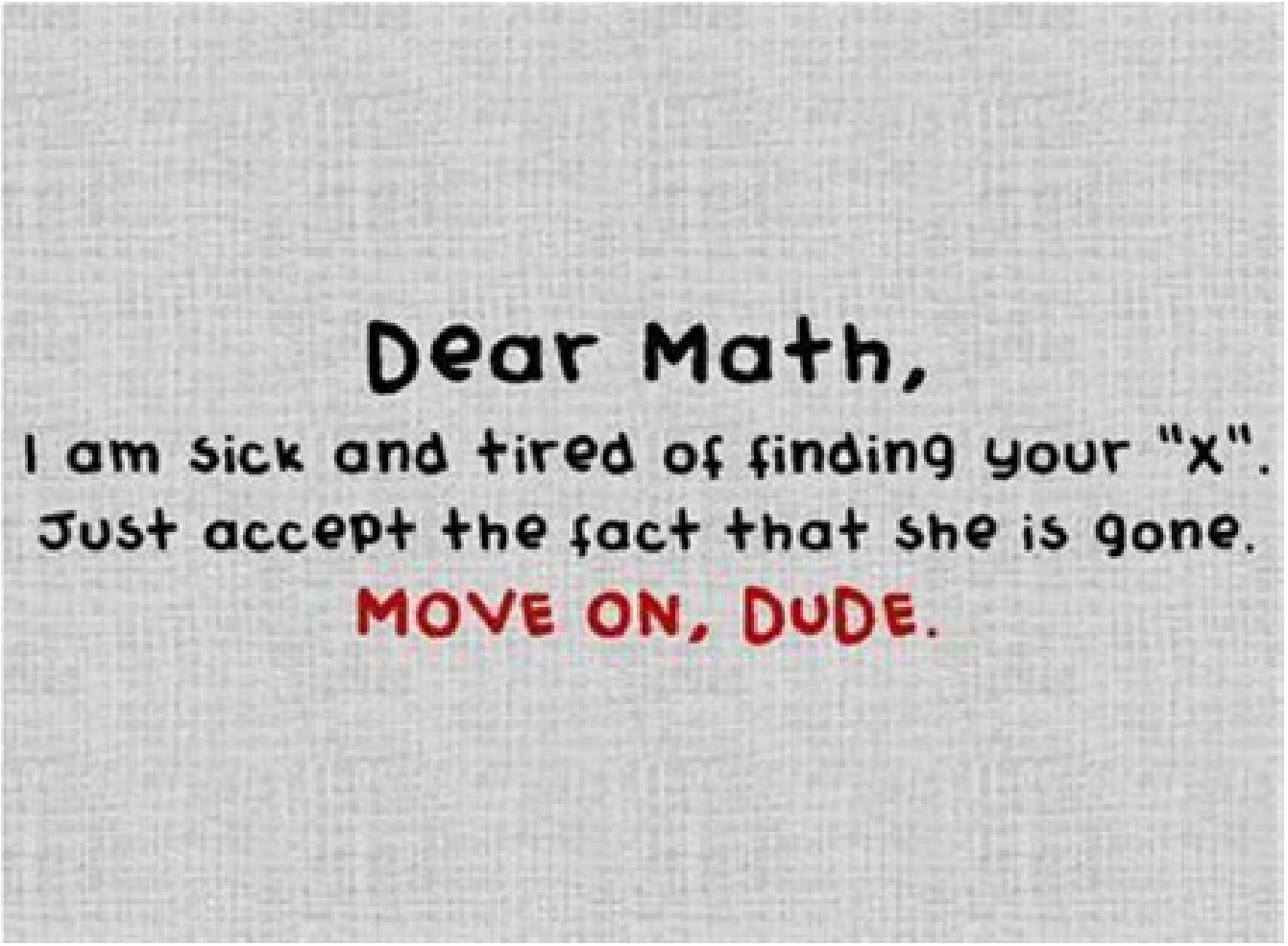
4. $y = 1/2x + 3$
   $4x = y + 4$
   sub.

5. $4x - 7y = -6$
   $-4x + 3y = -2$
   elim.

6. $x = 3y + 4$
   $x + 9y = 16$
   Sub.

Warm-Up

Systems of Equations Word Problems

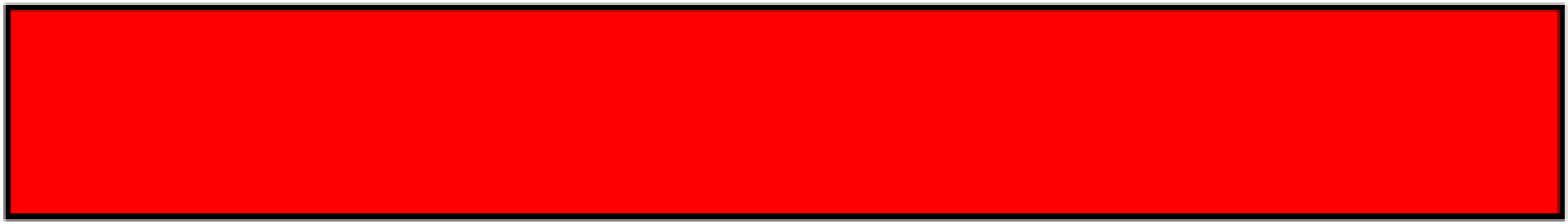


Objectives....

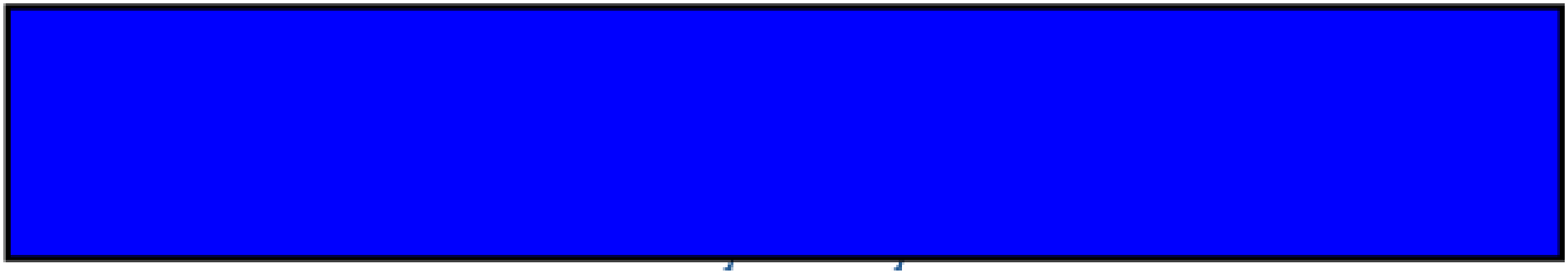
* You will find the solutions to systems of equations in real world scenarios.

* You will be able to represent constraints in equations & inequalities.

What is Linear Programming?



What are contraints?



Steps for writing equations for a system:

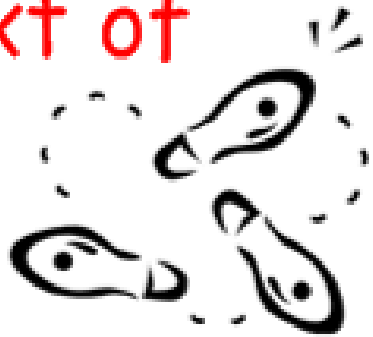
1. Determine the question.

2. Describe the variables used for the unknowns.

3. Translate the conditions in the problem into two equations.

4. Solve the system by the best method.

5. Analyze the solution in the context of the situation.



One number added to twice another number is 14. Two times the first number added to twice the second number is 18. What are the two numbers?

$x = 1^{st}$ #

$y = 2^{nd}$ #

$-1(x + 2y = 14) \cdot -1$

$2x + 2y = 18$

$-x - 2y = -14$

$+\ 2x + 2y = 18$

$x = 4$

$4 + 2y = 14$

$-4 \quad -4$

$\frac{2y}{2} = \frac{10}{2}$

$y = 5$

$(4, 5)$

Ace Car Rental rents a car for $45 and .25 per mile. Star Car Rental rents a car for $35 and .30 per mile. How many miles would a driver need to drive before the cost of renting a car at Ace Car Rental and renting a car at Star Car Rental were the same?

Variables

x = # of miles

y = total cost for rental

Ace Car Rental

$y = .25x + 45$

Star Car Rental

$y = .30x + 35$

$= .30(200) + 35$

$y = \$95$

$.25x + 45 = .30x + 35$

$-.25x \quad -.25x$

$45 = .05x + 35$

$-35 \quad -35$

$\frac{10}{.05} = \frac{.05x}{.05}$

$x = 200$

Ace Car Rental rents a car for $45 and .25 per mile. Star Car Rental rents a car for $35 and .30 per mile.

$C = 0.25m + 45$

$C = 0.30m + 35$

$C = 0.25(200) + 45$

$C = 95$

$0.25m + 45 = 0.30m + 35$

$-.25m - 35 \quad -.25m - 35$

$\frac{10}{.05} = \frac{0.05m}{.05}$

$200 = m$

$C = \$95$

$m = 200$ miles

A restaurant charges one price for adults and another for children. The Logan family has two adults and three children, and their bill was $24 The Griffee family has three adults and one child. Their bill was $22. What is the adult price and the child price for the buffet?

Variables

x = adult price

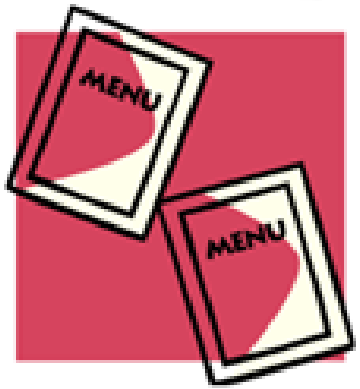
y = child price

Logan Family

$24 = 2x + 3y$

Griffee Family

$22 = 3x + y$



A restaurant charges one price for adults and another for children. The Logan family has two adults and three children, and their bill was $24 The Griffee family has three adults and one child. Their bill was $22. What is the adult price and the child price for the buffet?

$24 = 2a + 3c$

$-3(22 = 3a + c)-3$

$24=2a+3c$

$+\ -66=-9a-3c$

$\frac{-42}{-7}=\frac{-7a}{-7}$

$\$6=a$

$24=2(6)+3c$

$24=12+3c$

$-12\ \ -12$

$\frac{12}{3}=\frac{3c}{3}$

$\$4=c$

Wesley has a total of 40 DVDs of movies and television shows. The number of movies is 4 less than 3 times the number of television shows. How many movies and television shows does he have on DVD?

Variables

m = # of movies

t = # of TV shows

Total

$40 = m + t$

$40 = 3t - 4 + t$

$40 = 4t - 4$

$+4 \quad +4$

$\frac{44}{4} = \frac{4t}{4}$

$11 = t$

Movies

$m = 3t - 4$

$= 3(11) - 4$

$= 33 - 4$

$m = 29$

11 tv shows

29 movies

Now you can...

* Find the solutions to systems of equations in real world scenarios.

* Represent constraints in equations & inequalities.

Solving Word Problems using Systems of Equations & Inequalities Worksheet