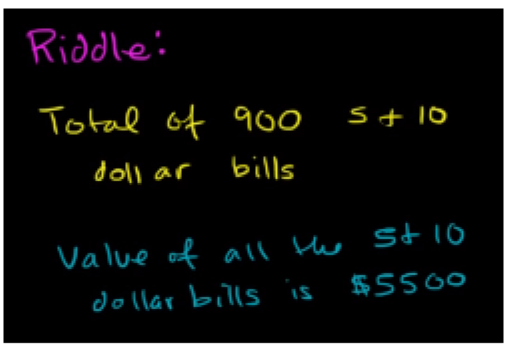
Let’s say it costs $5 to cross a bridge. This troll collects the money.

Unfortunately, we don’t have money, so he takes pity and gives us a riddle. If we solve it, he will allow us to cross free of charge:



…Basically, he has 900 bills of 5’s and 10’s. Combined, the 5’s and 10’s make up a total of $5500.

How many 5’s and and 10’s does he have?

Step One:

Let **f** represent the 5-dollar bills.

Let **t** represent the 10-dollar bills.

f = # of $5 bills

t = # of $10 bills

Step Two:

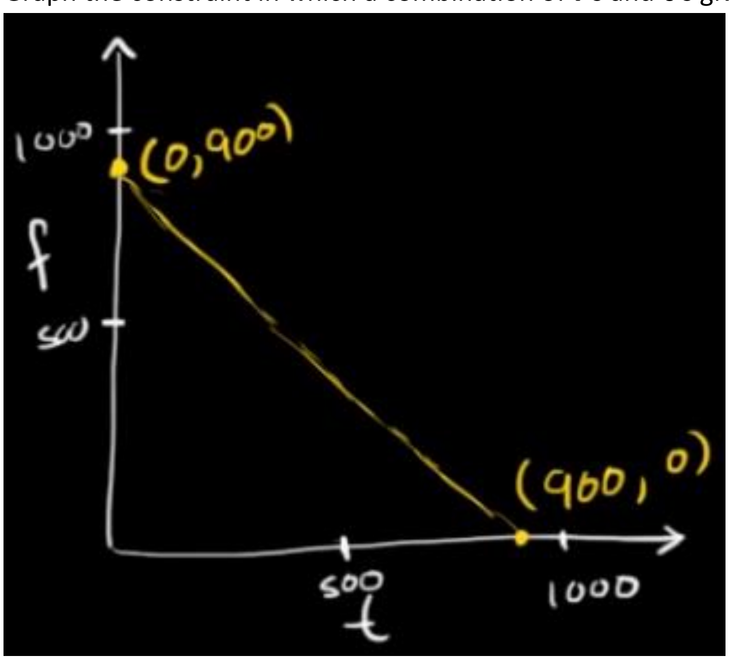
Designate 2 equations:

$$f + t = 900$$

$$5f + 10t = 5500$$

Step Three:

Graph the constraint in which a combination of **f**'s and **t**'s gives us a total of **900** bills:



…so theoretically we can have an extreme of all 900 bills as 5's with no 10's...

...or theoretically we can have an extreme of all 900 bills as 10's and no 5's...

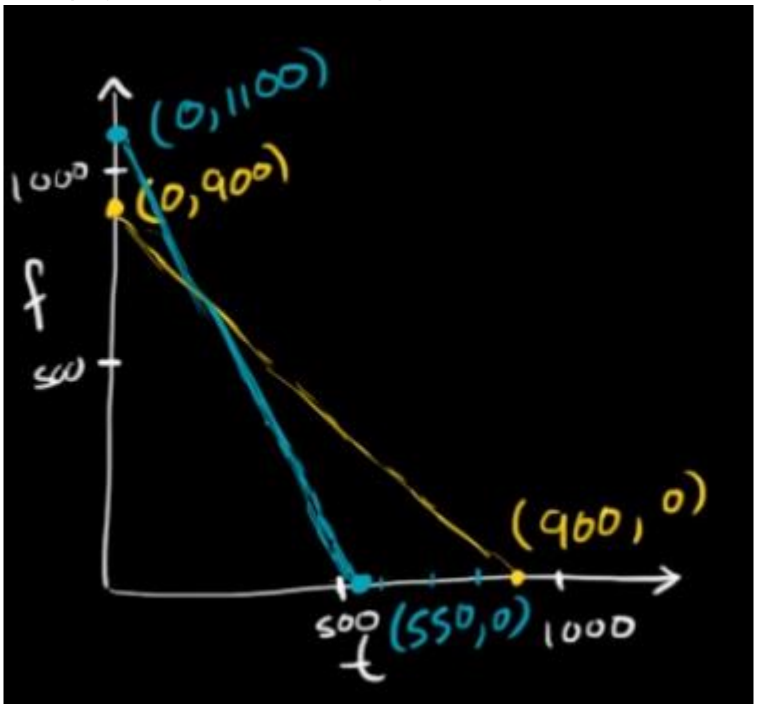
Step Four:

Graph another constraint in which a combination of **$5** and **$10** gives us a total of **$5500**:

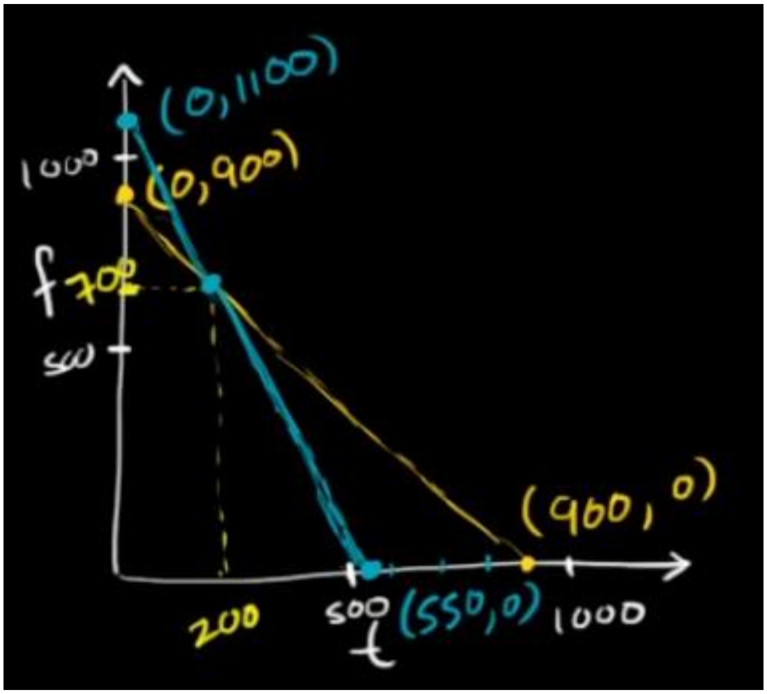
t	F
0	1100
550	0

…so theoretically we can have an extreme of 1100 5’s with no 10’s...
...or theoretically we can have an extreme of 550 10’s with no 5’s...

Let’s graph the 2 constraints together:



Step Five:
Let’s find the point that satisfies both constraints. Where is it located? Where they intersect!



...that point rests at:
t= 200
f= 700

If we add 200 to 700, we see that this point does indeed satisfy the first constraint of 900:

$$f + t = 900$$

And if we plug in the numbers for the variables...

$$5f + 10t = 5500$$

$$\underbrace{5\cdot 700}_{3500} + \underbrace{10\cdot 200}_{2000}$$

...we end up with a total of $5500!

$$= 5500$$