

# Lesson 1.4.5: Application of Systems of Equations

## Targets:

1. I can use systems of equations to solve real world scenarios.

## Warm Up

In Lewis Carroll's *Through the Looking Glass*, Tweedledum says, "The sum of your weight and twice mine is 361 pounds." Tweedledee replies, "The sum of your weight and twice mine is 362 pounds." Find both of their weights.

## Practice 1

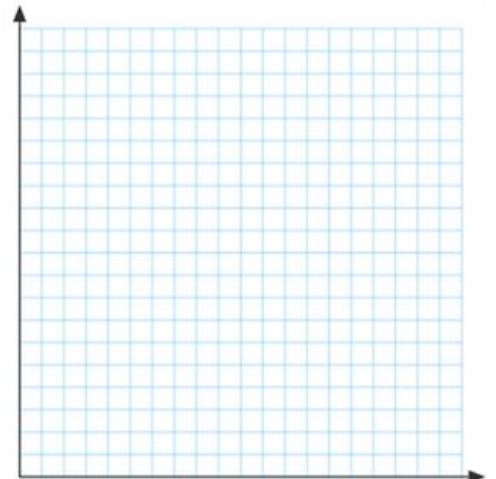
Lulu tells her little brother, Jack, that she is holding 20 coins all of which are dimes and quarters. They have a value of \$4.10. She says she will give him the coins if he can tell her how many of each she is holding. Solve this problem for Jack.

## Practice 2

*At a state fair, there is a game where you throw a ball at a pyramid of cans. If you knock over all of the cans, you win a prize. The cost is 3 throws for \$1. However, you can also buy an armband at the front gate for \$10 which makes games cheaper. If you have an armband, you get 6 throws for \$1.*

- a. Write two cost equations for the game in terms of the number of throws purchased - one without an armband and one with.
- b. Graph the two equations on the same graph. Be sure to label the axes and show an appropriate scale.

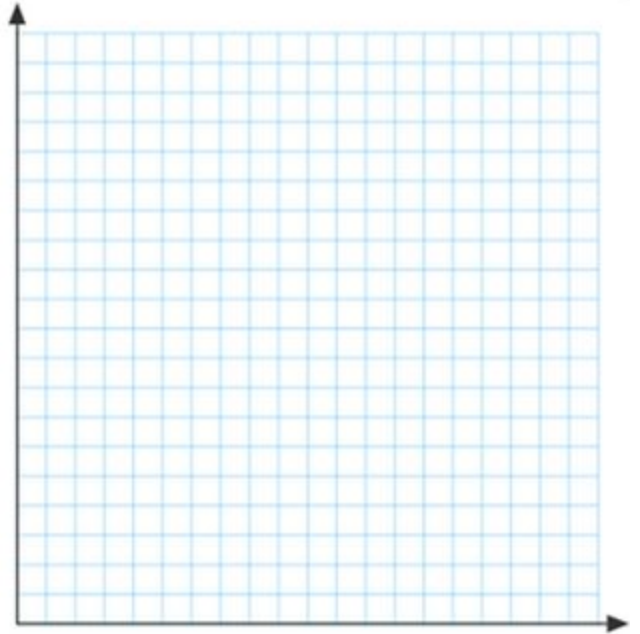
- c. Does it make sense to buy the armband?



### Practice 3

A clothing manufacturer has 1000 yd. of cotton to make shirts and pajamas. A shirt requires 1 yd. of fabric and a pair of pajamas requires 2 yd. of fabric. It takes 2 hr. to make a shirt and 3 hr. to make the pajamas, and there are 1600 hr. available to make the clothing.

- What are the variables?
- What are the constraints? (what are the limits)
- Write inequalities for the constraints.
- Graph the inequalities and shade the solution set.
- What does the shaded region represent?



### Exit Ticket

Andy's Cab Service charges a \$6 fee plus \$0.50 per mile. His twin brother Randy starts a rival business where he charges \$0.80 per mile, but does not charge a fee.

- Write a cost equation for each cab service in terms of the number of miles.
- Graph both cost equations.
- For what trip distances should a customer use Andy's Cab Service? For what trip distances should a customer use Randy's Cab Service? Justify your answer algebraically and show the location of the solution on the graph.

