

MATH 8: UNIT 4: SYSTEMS OF EQUATIONS

A system of equations means to compare two linear equations, and see if there are any common solutions; that is, a point where two linear equations cross on a graph. Applications include:

- Should you buy a season pass to Great America?
- Should you pay for unlimited data on your phone plan?
- Should you buy a monthly bus pass?

Useful text: Chapter 6: Systems of equations and inequalities, pages 325 - 390

Section 1: Use algebra and graphing to solve two linear equations. The solution will have either one solution as one intersection point, many solutions (be the same line), or no solution (parallel or other non-intersecting lines).

Section 2: Compare a system of two linear equations to evaluate a purchasing decision.

Section 1: Use algebra and graphing to solve two linear equations. The solution will have either one solution as one intersection point, many solutions (be the same line), or no solution (parallel or other non-intersecting lines).

- a. An equation in the form of $y = mx + b$ is a straight line with slope of m and y -intercept of b . If you have two of these linear equations, you can use algebra to solve this “system” to discover at what point these two lines cross. We’ll practice this method.
- b. Once you use algebra to discover a solution, we need to verify the answer by putting the x and y values back into the equation to make sure it’s equal.
- c. We’ll take two linear equations and determine if their graphed lines cross (one solution), never touch (no solutions), or are the same line (many solutions).
- d. We’ll graph two linear equations to determine what solutions are in this system; that is, if the lines cross, don’t cross, or are the same line.

Section 2: Compare a system of two linear equations to evaluate a purchasing decision.

- a. We’ll consider a story of how much money an item costs, and create a linear equation to represent this cost with how many you choose to buy, or how much you pay for a repeating cost like a cell phone plan, car payment, etc.
- b. We’ll take a second option with how much money a similar item costs, and compare its equation with the first. We’ll find if the two options would ever cost the same amount of money.
- c. We’ll evaluate the two options to conclude which purchasing option is less money for a given quantity to buy or given time to use the service.