7.2 Two Variable Linear Systems

In section 7.2 you will learn to
• Use the method of elimination to solve systems of linear equations in two variables.
• Interpret graphically and algebraically the number of solutions to a system of linear equations.
• Model and solve real-life problems.

Two variable linear systems

To solve linear equations, we can use a third method, Elimination.

Example:

\[
3x - 2y = 7 \\
8x + 4y = 0
\]

Elimination
• Multiply the equations by numbers to make the coefficients of one of the variables add to 0.
• Add the two equations together.
• Solve for x or y.
• Back substitute to get the value of the other variable.
Example 2:
3y = 4x - 5
-8x + 6y = 1

Example 3:
2x - y = 9
-10x + 5y = 45

Example 4:
Two planes start from LAX and fly in opposite directions. The second plane starts 1/2 hour after the first plane, but its speed is 80 km/h faster. Find the airspeed of each plane if 2 hours after the first plane departs the planes are 3200 km apart.
Example 5

A total of $32,000 is invested in two municipal bonds that pay 5.75% and 6.25% simple interest. The investor wants an annual interest income of $1900 from the investments. What amount should be invested in the 5.75% bond?