Algebra 2 Solving Systems of Inequalities Investigation

Investigation
Paying for College

A total of $40,000 has been donated to a college scholarship fund. The administrators of the fund are considering how much to invest in stocks and how much to invest in bonds. Stocks usually pay more but are often a riskier investment, whereas bonds pay less but are usually safer.

Step 1 | Let x represent the amount in dollars invested in stocks, and let y represent the amount in dollars invested in bonds. Graph the equation $x + y = 40{,}000$.

Step 2 | Name at least five pairs of x- and y-values that satisfy the inequality $x + y < 40{,}000$ and plot them on your graph. In this problem, why can $x + y$ be less than $40,000?

Step 3 | Describe where all possible solutions to the inequality $x + y < 40{,}000$ are located. Shade this region on your graph.

Step 4 | Describe some points that fit the condition $x + y \leq 40{,}000$ but do not make sense for the situation.

Assume that each option—stocks or bonds—requires a minimum investment of $5,000, and that the fund administrators want to purchase some stocks and some bonds. Based on the advice of their financial advisor, they decide that the amount invested in bonds should be at least twice the amount invested in stocks.

Step 5 | Translate all of the limitations, or **constraints,** into a system of inequalities. A table might help you to organize this information.

Step 6 | Graph all of the inequalities and determine the region of your graph that will satisfy all the constraints. Find each corner, or **vertex,** of this region.