# I. Solve the Linear Equation, Verify Solution with a Graph and a Table

a. Suppose that and . Find values such that .

b. Using the conditions in part a, find all values such that

c. Find the zero(s) for the function . d. Solve the linear equation: 

II. Solve the Rational Equation, Do Not Use Excluded Values

III. Construct a Linear Model: Applied Linear Equations

In 2020, there were 12,200 students at college A, with a projected enrollment **increase** of 1000 students per year. In the same year, there were 24,200 students at college B, with a projected enrollment **decrease** of 500 students per year. Assume that the projections above hold true. Write a function for college A. Write a function for college B. When will the colleges have the same enrollment? What will the enrollment be at that time?

IV. Solve the Percent Change Problem

a. After a 35% reduction in price, a person purchases a guitar for $780. What was the original price of the guitar?

b. Including a 7% sales tax, a hotel charges $235.40 per night for a room. Find the cost of the room before taxes.

VIII. Solve the Inequality, graph on a number line, and answer in interval notation

a. Suppose . On what interval is ?

b. Suppose . On what interval is ?

c. Solve the following inequality:

IX. Solve the Compound Inequality, graph on a number line, and answer in interval notation.

a. b.

c. A city commission has proposed two tax bills. The first bill requires that a homeowner pay $1800 plus 3% of the assessed home value. The second bill requires taxes of $200 plus 8% of the assessed home value. What price range of home assessment would make the first bill a better deal?

X. Solve the System of Linear Equation

b. c.

XI. Solve the System of Linear Equation: Revenue, Cost, and Profit Function

A company manufactures and sells a certain model of Bluetooth speakers. The fixed cost to operate daily production is and it costs to produce each speaker. The selling price is per speaker. Assume each unit produced is sold.

a. Write the revenue function, the cost functions, and determine the Break Even point.

b. How many units sold will result in a profit? Write as a set or interval.

V. Perform the Operations on the Complex Numbers. Answer in standard form.

a. b. c.

e.

# VI. Solve the Quadratic Equation, Use EXACT ANSWERS

a. b. c. ; Find the zeros.

VII. Find the Desired Length: Pythagorean Theorem

a. A rectangular park is 8 miles long and 4 miles wide with a hiking trail that runs diagonally across the park. How long is the trail? Round answer to the nearest tenth.

b. The base of a 14-foot ladder is 2 feet away from a building. If the ladder reaches the top of the flat roof, how tall is the building? Round answer to the nearest tenth.