Solving Systems by Elimination

Instructions: For each problem, define your variables, write two equations, solve using elimination, and answer in context. Show your work and verify your solution.

MILD

1. Two numbers have a sum of 52 and a difference of 14. Determine the two numbers.

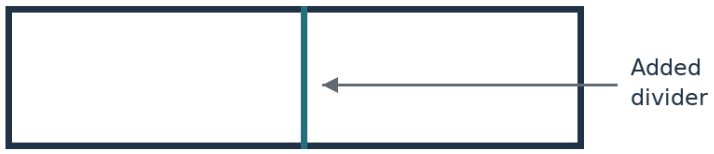
2. Two balance scales contain identical triangles and squares. Determine the mass of each shape using the information shown.



MEDIUM

3. A school uses vans and minibuses to transport students. On one trip, three vans and two minibuses transport 56 students. On another trip, two vans and one minibus transport 32 students. If every seat is occupied on both trips, how many students can each type of vehicle carry?

4. A rectangular garden is enclosed by 84 m of fencing. A straight divider is then built between its two longer sides, increasing the total fencing to 100 m. Determine the length and width of the garden.



5. A jar contains 45 coins, consisting entirely of dimes and quarters. The total value is $7.05. Determine how many dimes and quarters are in the jar.

6. At a school concert, 180 tickets were sold. Adult tickets cost $12 and student tickets cost $8. The school collected $1,840 in total ticket sales. Determine how many tickets of each type were sold.

SPICY

7. A juice company combines a drink containing 10% apple juice with another containing 40% apple juice to produce 12 L of a drink containing 30% apple juice. The remainder of each drink is water. Determine how many liters of each drink are needed, using elimination.

8. Two balance scales contain identical squares and circles. Determine the mass of each shape using the information shown.



EXTRA-SPICY

9. A cyclist and a runner train at constant speeds. On Saturday, the cyclist rides for 1.5 h and the runner runs for 1 h. Together, they travel 40 km. On Sunday, the cyclist rides for 2 h and the runner runs for 1.5 h. Together, they travel 55 km. Assuming each person's speed remains the same on both days, determine their speeds.