

SYSTEMS OF THREE LINEAR EQUATIONS IN THREE VARIABLES

➤ **Solve by the addition method (Linear Combination Method)**

$$1) \begin{cases} x + 4y - z = 10 \\ 3x + 2y + z = 4 \\ 2x - 3y + 2z = -7 \end{cases}$$

$$2) \begin{cases} 2x - 3y - z = 1 \\ x + 4y + 3z = 2 \\ 4x - 6y - 2z = 5 \end{cases}$$

$$3) \begin{cases} x - 3y + 2z = 1 \\ x - 2y + 3z = 5 \\ 2x - 6y + 4z = 3 \end{cases}$$

$$4) \begin{cases} 2x + y - 3z = 7 \\ x - 2y + 3z = 1 \\ 3x + 4y - 3z = 13 \end{cases}$$

PURCHASE PROBLEMS

- 5) A carpenter purchased 50 ft of redwood and 90 ft of pine for a total cost of \$31.20. A second purchase, at the same prices, included 200 ft of redwood and 100 ft of pine for a total cost of \$78. Find the cost per foot of redwood and of pine.

Redwood Cost/ft:

Pine Cost/ft:

- 6) A company manufactures both color and black-and-white television sets. The cost of materials for a black-and-white TV is \$25, whereas the cost of materials for a color TV is \$75. The cost of labor to manufacture a black-and-white TV is \$40, whereas the cost of labor to manufacture a color TV is \$65. During a week when the company has budgeted \$4800 for materials and \$4380 for labor, how many color TVs does the company plan to manufacture?

Color TVs:

COIN PROBLEMS

- 7) The total value of the quarters and dimes in a coin bank is \$6.90. If the quarters were dimes and the dimes were quarters, the total value of the coins would be \$7.80. Find the number of quarters in the bank.

Quarters:

- 8) A coin bank contains only nickels and dimes. The total value of the coins in the bank is \$2.50. If the nickels were dimes and the dimes were nickels, the total value of the coins would be \$3.20. Find the number of nickels in the bank.

Nickels:

RATE PROBLEMS

- 9) Flying with the wind, a small plane flew 320 mi in 2 hours. Against the wind, the plane could fly only 280 mi in the same amount of time. Find the rate of the plane in calm air and the rate of the wind.

Rate of Plane: Rate of wind:

- 10) A cabin cruiser traveling with the current went 48 mi in 3 hours. Against the current, it took 4 hours to travel the same distance. Find the rate of the cabin cruiser in calm water and rate of the current.

Rate of Cruiser: Rate of current:

MIXTURE PROBLEMS

- 11) A chemist has two alloys, one of which is 10% gold and 15% lead and the other of which is 30% gold and 40% lead. How many grams of each of the two alloys should be used to make an alloy that contains 60 g of gold and 88 g of lead?

Grams of 10%/15% alloy: Grams of 30%/40% alloy:

- 12) A pharmacist has two vitamin-supplement powders. The first powder is 25% vitamin B_1 and 15% vitamin B_2 . The second is 15% vitamin B_1 and 20% vitamin B_2 . How many milligrams of each of the two powders should the pharmacist use to make a mixture that contains 117.5 mg of vitamin B_1 and 120 mg of vitamin B_2 ?

mg of 25%/15% powder: mg of 15%/20% powder:

GEOMETRY PROBLEMS

13) Two angles are complementary. The larger angle is 9° more than eight times the measure of the smaller angle. Find the measure of the two angles. (Complementary angles are two angles whose sum is 90° .)

Angle 1: Angle 2:

14) Two angles are supplementary. The larger angle is 40° more than three times the measure of the smaller angle. Find the measure of the two angles. (Supplementary angles are two angles whose sum is 180° .)

Angle 1: Angle 2: