

More Applications of System-Solving

For each problem, develop a system of equations that represents the problem. In some cases, it can be helpful to start guessing first to develop a sense of how the equations will look. Some problems will require a 3x3 system. Note: on a test or quiz, answers shown without work receive *no credit*. These problems were printed on a single sheet to save paper. Show your work elsewhere or edit the page and print it at home.

1. A jetboat trip up a 45 mile stretch of river takes three hours and 45 minutes. The return trip takes 2 hours and 30 minutes. Assuming that the boat travels at the same speed on both trips, what are the speeds of the river and the boat?
2. At a restaurant, a hamburger and fries costs \$4.10, and 4 hamburgers and 2 fries cost \$13.70. What are the costs of each item?
3. A contractor hires a concrete company to do work on three separate jobs. Each time the company is hired, the contractor must pay for equipment rental on a daily basis, materials, and labor. The first job required equipment use for two days, used three yards of concrete and required 16 total hours of work. The second job required equipment for one day, used two yards, and required 6 hours of work. The last job required equipment for two days, used 7 yards of concrete and required 26 hours to complete. The total costs for each day, in order, were \$399, \$194 and \$654. Find the cost of equipment rental, the cost per yard of concrete, and the average labor cost per hour.
4. Clever Clyde arrived at his job site today and his boss was mad! The crew was supposed to mix up 600 pounds of concrete, and nobody knew how many bags to use because they didn't know how much each one weighed! The boss had already tried to balance a bag on one end of a plank with a 50 lb cinder block on the other, but one bag was too light to balance it and two bags were too heavy! "No problem," says Clever Clyde as he grabs a stack of small bricks. "Look, 10 bricks and one bag exactly balance with the cinder block. Also, two bags exactly balance with the cinder block and five bricks." How many bags did Clyde say to use?
5. According to professional sources, olive oil contains 10% linoleic acid, while canola oil contains 20% linoleic acid. If a 10 gallon batch of mixed oil is to be produced from these two oils, how much should be used to produce a mixture that is 17% linoleic acid?
6. An investor decides to place a total of \$1400 in two separate accounts earning simple interest. The account at Capital Gains earns 5.5% interest while the account at Fidelity One earns 8%. If the two accounts together produce \$88.25 in interest, how much was invested in each account?
7. You buy 72 golf balls for \$74.80. White golf balls cost \$0.95 each; orange golf balls cost \$1.15 each. How many of each color did you buy?
8. A jewelry manufacturer produces necklaces and earrings. In January, they made \$11,650 selling 82 necklaces and 100 pairs of earrings. In February, they made \$10,575 selling 75 necklaces and 90 pairs of earrings. They predict sales of 90 necklaces and 130 pairs of earrings in March. If their prediction is correct, how much will they earn?
9. Two concentrations of saltwater are mixed. One is 12% salt and one is 4% salt. How much is used to produce 50 gallons that has a concentration of 6%?