

Applications of Systems of Equations

- Sam runs a lemonade stand. One day he collected \$6.55 in nickels and dimes. The number of nickels was 6 more than half the number of dimes. Find out how many dimes Sam collected.
- Tickets to a college drama production cost \$2.50 for students and \$4.00 for non-students. If 285 tickets were sold for a total of \$1012.50, how many student tickets were sold?
- Grain worth 65¢ per pound was mixed with grain worth 90¢ per pound to produce 20 pounds of a mixture worth 80¢ per pound. Find how many pounds of each was used.
- A peanut merchant sells two kinds of peanuts, one for 60¢ per pound and the other for 50¢ per pound. How much of each should he mix to get 50 pounds that is worth 52¢ per pound?
- A jeweler wants to make 1600 grams of 25% silver compound by mixing 20% and 40% silver compounds together. How many grams of each kind will she need?
- In a high school chemistry lab, James has two solutions, one containing 15% oil and the other containing 25% oil. How many cubic centimeters of each should he use to make 120 cm³ of a 21% oil solution?
- Two angles are complementary. The measure of the smaller angle is seven-eighths the measure of the larger angle. Find the measure of the smaller angle.
- Two angles are supplementary. The measure of one angle is 20° less than three times the other. Find the measure of the larger angle.
- The measure of the smaller of two complementary angles is 10° more than one-fourth the measure of the larger angle. What is the measure of each angle?
- A square and an equilateral triangle have the same perimeter, and a side of the square is 6 in. longer than half a side of the triangle. What is the perimeter of each figure?
- Gilbert plans to invest \$12,000 into two types of bonds which yield 9% and 11% annually. If he wants to earn a total of \$1200 annually, how much should he invest in each bond?
- The Smith family has \$5000 to invest in bonds and certificates of deposit (CDs). If the bonds earn 9% yearly and the CDs earn 10% yearly, how much should the Smiths put into each investment to earn \$485 per year?
- A small plane makes a 240-kilometer trip against the wind in 1.5 hours and returns, with a tail wind of the same speed, in 1 hour. What is the speed of the plane in still air?
- A sightseeing boat on the Mississippi River took 2½ hours to go 12 miles upriver and 12 miles back. If the rate at which the boat travels in still water is 5 times the rate of the river current, find the rate of the current.
- A southbound train leaves the station at 8 am and a northbound train leaves the same station at 9 am. At 10 am the trains are 500 km apart and at 11 am they are 850 km apart. Assuming constant speeds, how fast is each train travelling?
- One train, heading west, leaves the station. Two hours later a second train, heading east, leaves the same station, travelling 15 mph faster than the first train. Six hours after the second train left, the two trains are 580 miles apart. Assuming all speeds are constant, how fast is each train travelling?
- An airline maintains three different classes of service in a Boeing 747: first, business, and economy. The configuration of the plane (number of seats in each class) is based on demand. There are 42 seats available for either first or business class, and 570 seats for either business or economy class. If, on a certain flight, there are 34 times as many economy as first class seats, what is the configuration of the plane?
- In a factory there are three polishing machines, labeled A, B, and C. When all three of them are working, 5700 lenses can be polished in a week. When only A and B are working, 3400 lenses can be polished, and when only B and C are working, 4200 lenses can be polished. How many lenses can be polished in a week by each machine?

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| 1.
Answer: 50
CodePath: EAS.TRI.F.G.33 | 15.
Answer: Southbound 150 kph, Northbound
200 kph
CodePath: EAS.TRI.F.G.81 |
| 2.
Answer: 85
CodePath: EAS.TRI.F.G.37 | 16.
Answer: 35 mph, 50 mph
CodePath: EAS.TRI.F.G.82 |
| 3.
Answer: 8 lb at 65¢, 12 lbs at 90¢
CodePath: EAS.TRI.F.G.45 | 17.
Answer: 16 first class, 26 business,
544 economy
CodePath: EAS.TRI.F.G.98 |
| 4.
Answer: 40 lbs at 50¢, 10 lbs at 60¢
CodePath: EAS.TRI.F.G.47 | 18.
Answer: A—1500, B—1900, C—2300
CodePath: EAS.TRI.F.G.99 |
| 5.
Answer: 1200 g at 20%, 400 g at 40%
CodePath: EAS.TRI.F.G.49 | |
| 6.
Answer: 72 cc of 25%, 48 cc of 15%
CodePath: EAS.TRI.F.G.51 | |
| 7.
Answer: 42°
CodePath: EAS.TRI.F.G.53 | |
| 8.
Answer: 130°
CodePath: EAS.TRI.F.G.54 | |
| 9.
Answer: 64°, 26°
CodePath: EAS.TRI.F.G.56 | |
| 10.
Answer: 72 in.
CodePath: EAS.TRI.F.G.59 | |
| 11.
Answer: \$6000 at 9%, \$6000 at 11%
CodePath: EAS.TRI.F.G.69 | |
| 12.
Answer: \$1500 in bonds, \$3500 in certificates
CodePath: EAS.TRI.F.G.70 | |
| 13.
Answer: 200 kph
CodePath: EAS.TRI.F.G.78 | |
| 14.
Answer: 2 mph
CodePath: EAS.TRI.F.G.79 | |