

PROBLEM SOLVING

EXAMPLE 4

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for Exs. 42–47

42. **PIZZA SPECIALS** At a pizza shop, two small pizzas, a liter of soda, and a salad cost \$14; one small pizza, a liter of soda, and three salads cost \$15; and three small pizzas and a liter of soda cost \$16. What is the cost of one small pizza? of one liter of soda? of one salad?

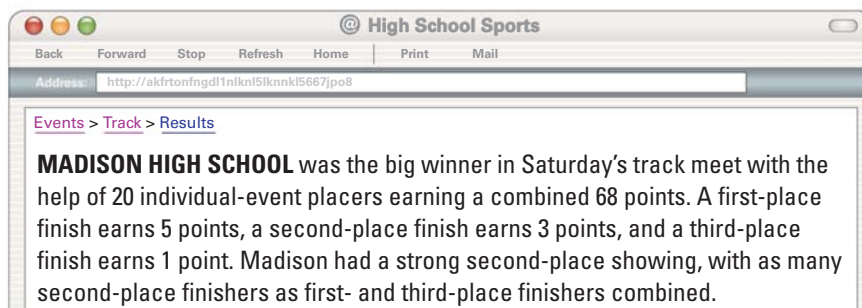
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43. **HEALTH CLUB** The juice bar at a health club receives a delivery of juice at the beginning of each month. Over a three month period, the health club received 1200 gallons of orange juice, 900 gallons of pineapple juice, and 1000 gallons of grapefruit juice. The table shows the composition of each juice delivery. How many gallons of juice did the health club receive in each delivery?

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Juice	1st delivery	2nd delivery	3rd delivery
Orange	70%	50%	30%
Pineapple	20%	30%	30%
Grapefruit	10%	20%	40%

44. **MULTI-STEP PROBLEM** You make a tape of your friend's three favorite TV shows: a comedy, a drama, and a reality show. An episode of the comedy lasts 30 minutes, while an episode of the drama or the reality show lasts 60 minutes. The tape can hold 360 minutes of programming. You completely fill the tape with 7 episodes and include twice as many episodes of the drama as the comedy.
- Write a system of equations to represent this situation.
 - Solve the system from part (a). How many episodes of each show are on the tape?
 - How would your answer to part (b) change if you completely filled the tape with only 5 episodes but still included twice as many episodes of the drama as the comedy?
45. **TAKS REASONING** The following Internet announcement describes the results of a high school track meet.



Events > Track > Results

MADISON HIGH SCHOOL was the big winner in Saturday's track meet with the help of 20 individual-event placers earning a combined 68 points. A first-place finish earns 5 points, a second-place finish earns 3 points, and a third-place finish earns 1 point. Madison had a strong second-place showing, with as many second-place finishers as first- and third-place finishers combined.

- Write and solve a system of equations to find the number of athletes who finished in first place, in second place, and in third place.
- Suppose the announcement had claimed that the Madison athletes scored a total of 70 points instead of 68 points. Show that this claim must be false because the solution of the resulting linear system is not reasonable.