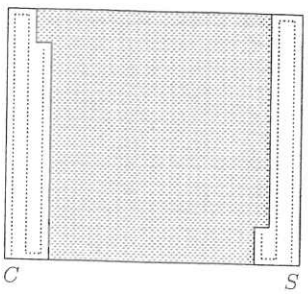
STUMPERS 13

(1) Sam and Cam have a lawn-mowing service. Their first job tomorrow morning is one that usually takes Sam 40 minutes to do alone, or Cam 30 minutes to do alone. This time they are going to team up, Sam starting at one side and Cam at the other side. The problem is to predict how many minutes it will take them to finish the job. What part of the lawn will Sam complete in the first ten minutes? What part of the lawn will Cam complete in the first ten minutes? What part of the lawn will the team complete in ten minutes? Set up a guess-and-check table with columns titled "minutes", "Sam part", "Cam part" and "Team part". What is the target value for the team part? Fill in two rows of the chart by making guesses in the minutes column. Then guess m and complete the solution algebraically.



(2) Write an expression that represents the number that

(a) is 7 more than x; (b) is 7 less than x; (c) is x more than 7;
(d) exceeds x by 7; (e) is x less than 7; (f) exceeds 7 by x.

(3) Graph on a number line the intervals corresponding to these two signs on the highway.

(a) The maximum speed is 65 mph and the minimum speed is 45 mph.
(b) The maximum speed is 55 mph.

(4) There are 396 persons in a theater. If the *ratio* of women to men is 2:3, and the ratio of men to children is 1:2, how many men are in the theater?

(5) .On a number line, graph a number that is twice as far from 5 as it is from 8. How many such numbers are there?

(6) Intervals on a number line are often described using the symbols $<$ ("less than"), $>$ ("greater than"), $\leq$ ("less than or equal to"), and $\geq$ ("greater than or equal to"). As you graph the following inequalities, remember the *endpoint convention* regarding the use of the dot $\bullet$ and the circle $\circ$ for included and excluded endpoints, respectively:

(a) $x < 5$ (b) $x \geq -6$ (c) $-12 \geq x$ (d) $4 < x < 8$ (e) $x < -3$ or $7 \leq x$

(7) Solve the equation $A = P + Prt$ for r. Solve the equation $A = P + Prt$ for P.

(8) Using a number line, describe the location of $\dfrac{x+y}{2}$ in relation to the locations of x and y. Is your answer affected by knowing whether x and y are positive or not?

(9) Find the smallest positive integer divisible by every positive integer less than or equal to 10.

(10) The indicator on the oil tank in my home indicated that the tank was one-eighth full. After a truck delivered 240 gallons of oil, the indicator showed that the tank was half full. What is the capacity of the oil tank, in gallons?