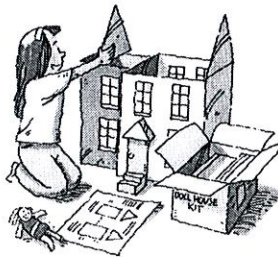


7.3.4 How can I find the unknown?

Writing Algebraic Equations and Inequalities



7-114

7-114. Ellie is building a dollhouse. She has boards that are two different lengths. A long board is 17 inches longer than the short board. If the length of the long board is 41 inches, how long is the short board?

- a) Draw a diagram and define a variable
- b) Write an equation and use inverses to solve.

7-115

7-115. Jeffrey is comparing the number of pages in his science book to his math book. The number of pages in his hardback science textbook is unknown.

- a) Jeffrey also has a paperback science lab manual that is 50 pages. Define a variable and write an expression for the total number of pages of science materials, including the hardback textbook.
- b) By looking at his math book, Jeffrey thinks the total number of pages of science materials is more than the 425 pages of his math book. Write an inequality that compares his science and math materials.

7-116

7-116. Mo-Qui is studying for his Spanish and History final exams. He knows that he needs to spend more time studying Spanish than History. He decides he will spend half an hour more studying Spanish than History.

*Let h represent the amount of time Mo-Qui spends studying History.

- a) Write an expression using h that represents the amount of time he spends studying Spanish. $h + 30 = 120 \text{ min}$
- b) Mo-Qui spends more than 2 hours and 15 minutes studying for Spanish. Write an inequality to represent this situation.

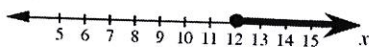
METHODS AND MEANINGS
MATH NOTES

GRAPHING INEQUALITIES WITH ONE VARIABLE:

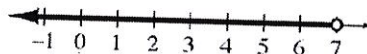
1. Start by drawing a number line that includes key values from the problem
2. Draw a line on all of the values that could be a solution to the problem.
3. Where would the line that is formed by the plotted points end? That is, what would be the **boundary points**? Is the boundary point for this problem part of the set of solutions to be included on the number line? If the boundary point is part of the set of solutions, then it would be represented as a filled-in dot.

Graphing Inequalities examples:

a) $x \geq 12$



b) $x < 7$



Let $S = \text{short}$
 a) board length

7-114



$$b) \begin{aligned} S + 17 &= 41 \\ S &= 24 \text{ in} \end{aligned}$$

$$\begin{array}{r} 3 \\ 41 \\ -17 \\ \hline 24 \end{array}$$

The short board
 is 24 in. long.

7-115

a) Let $H = \text{number of pages in the hardback science book.}$
 $H + 50$

$$b) \begin{aligned} H + 50 &> 425 \text{ — or —} \\ 425 &< H + 50 \end{aligned}$$

7-116

$$a) \begin{aligned} h + 30 & \text{ or } h + \frac{1}{2} \\ \text{minutes} & \text{ hours} \end{aligned}$$

$$b) \begin{aligned} h + 30 &> 135 \text{ or } h + \frac{1}{2} > 2\frac{1}{4} \\ \text{min.} & \text{ hrs.} \end{aligned}$$

* units (min.) must match *