SOLUTIONS TO EXERCISES:
THE LANGUAGE OF MATHEMATICS

1a. 3

1b. $1+2$, $3+0$, $\frac{1}{2}+\frac{5}{2}$, etc.

1c. $4-1$, $5-2$, $3-0$, etc.

1d. $6\div 2$, $9\div 3$, etc.

2. two: $2=1+1=3-1=6\div 3$ etc.

six: $6=4+2=9-3=12\div 2$ etc.

zero: $0=-1+1=2-2=0\div 7$ etc.

one: $1=\frac{1}{2}+\frac{1}{2}=3-2=2\div 2$ etc.

3a. The capital of Massachusetts (is) Boston.

3b. The capital of Massachusetts (is) Pittsfield.

3c. $3+4$ (=) 7

3d. $3+4$ (=) 8

4a. true

4b. false

4c. true

4d. false

5. Proper nouns are capitalized (Massachusetts, Boston). The first letter of a sentence is capitalized; a declarative sentence ends with a period.

The solutions to 6 and 7 are combined:

6a. Carol; English noun

6b. Carol (loves) mathematics; English sentence; sometimes true/sometimes false

6c. The name 'Carol' (begins) with the letter 'C'; English sentence; true

6d. 7; mathematical expression

6e. $3+4$; 'three plus four'; mathematical expression

6f. 7 (=) $3+4$; 'seven equals three plus four'; mathematical sentence; true

6g. $3+4$ (=) 7; 'three plus four equals seven'; mathematical sentence; true

6h. 7 (=) $3+5$; 'seven equals three plus five'; mathematical sentence; false

6i. t; 'tee'; mathematical expression

6j. t (=) 2; 'tee equals two'; mathematical sentence; sometimes true/sometimes false

6k. 0 (=) $2-t$; 'zero equals two minus tee'; mathematical sentence; sometimes true/sometimes false

6l. $t-1$; 'tee minus one'; mathematical expression

6m. $t-1$ (=) $1-t$; 'tee minus one equals one minus tee'; mathematical sentence; sometimes true/sometimes false

6n. $t+t+t$; 'tee plus tee plus tee'; mathematical expression

6o. $t-0$ (=) t; 'tee minus zero equals tee'; mathematical sentence; always true

6p. 0 (=) 1; 'zero equals one'; mathematical sentence; false

7. (See solutions to problem 6.)

8. EXP
9. EXP
10. EXP
11. SEN, ST/SF
12. EXP
13. EXP
14. SEN, ST/SF
15. SEN, T
16. TRUE: The name 'Julia' begins with the letter 'J'.
    FALSE: The name 'Julia' begins with the letter 'G'.
    ST/SF: Julia has red hair.
17. TRUE: $1 + 2 = 3$ FALSE: $1 + 4 = 3$ ST/SF: $x = 3$
18. TRUE: $x = x$ FALSE: $x = x + 1$ ST/SF: $x = 1$