

# Homework

p. 42-43: 1 - 5, 8 - 12, 14

- 1 What four elements are found in any deductive structure?
- 2 Which of the following kinds of statements are always reversible?
  - a Definitions
  - b Theorems
  - c Postulates
- 3 Answer each question Yes or No.
  - a Do we prove theorems?
  - b Do we prove definitions?
- 4 Tell whether each of the following statements is a theorem or a definition.
  - a If two angles are right angles, then they are congruent.
  - b If a ray bisects an angle, it divides the angle into two congruent angles.
- 5 a Write the converse of each of the following statements.
  - i If A, then B.
  - ii  $\text{Rain} \Rightarrow \text{wet}$
  - iii If an angle is a  $45^\circ$  angle, then it is acute.
  - iv If a point is the midpoint of a segment, it divides the segment into two congruent segments.

b Discuss the truth of each of the converses in part a.

In problems 8–12, study each of the arguments and state whether or not the conclusion is deducible. If it is not, comment on the error in the reasoning.

- 8 If a student at Niles High has room 303 as his or her homeroom, the student is a freshman. Joe Jacobs is a student at Niles High and has room 303 as his homeroom. Therefore, Joe Jacobs is a freshman.
- 9 If the three angles of a triangle are acute, then the triangle is acute. In triangle ABC, angle A and angle B are acute. Therefore, triangle ABC is acute.
- 10 All school buses stop at railroad crossings. A vehicle stopped at the Santa Fe railroad crossing. Therefore, that vehicle is a school bus.
- 11 All cloudy days are depressing. Therefore, since I was depressed on Thursday, Thursday was cloudy.
- 12 If two angles of a triangle are congruent, then the sides opposite them are congruent. In  $\triangle ABC$ ,  $\angle A \cong \angle B$ . Therefore, in  $\triangle ABC$ ,  $\overline{BC} \cong \overline{AC}$ .

14 The Bronx Zoo has a green lizard, a red crocodile, and a purple monkey. They are the only animals of their kind in existence. One violently windy Saturday, their name tags blew off, and their keeper's journal was torn to shreds. Inasmuch as they were to appear on television at 7:30 Sunday morning, the night watchman had to replace their name tags. He managed to piece together the following information from the mangled journal.

- 1 Wendy cannot get along with the lizard.
- 2 Katie playfully took a bite out of the monkey's ear one month ago.
- 3 Wendy never casts a red reflection in the mirror.
- 4 Jody has the personality of a crocodile, but she isn't one.

Match the animals with their names.