

# EXERCISES

For more exercises, see *Extra Skill*, *Word Problem*, and *Proof Practice*.

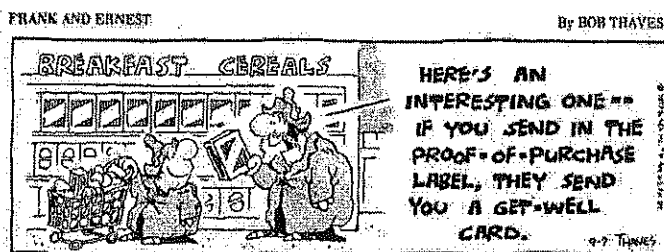
## Practice and Problem Solving

### Practice by Example

Example 1  
(page 80)



1. Identify the hypothesis and the conclusion in the cartoon.



Identify the hypothesis and conclusion of each conditional.

2. If you want to be fit, then you want to get plenty of exercise.
3. Algebra  $x^2$  If  $x + 20 = 32$ , then  $x = 12$ .
4. "If you can see the magic in a fairy tale, you can face the future."  
— Danielle Steel, novelist
5. "If somebody throws a brick at me, I can catch it and throw it back."  
— Harry S Truman
6. "If you can accept defeat and open your pay envelope without feeling guilty, you're stealing." — George Allen, former NFL coach

#### Problem Solving Hint

Some conditionals may omit *then*. You can insert it mentally if you wish.



7. "If my fans think that I can do everything I say I can do, then they're crazier than I am." — Muhammad Ali



8. "... if I could paint that flower in a huge scale, you could not ignore its beauty." — Georgia O'Keeffe, artist

Example 2  
(page 80)

Write each sentence as a conditional.

9. Glass objects are fragile.
10. Algebra  $x^2$   $3x - 7 = 14$  implies that  $3x = 21$ .
11. Whole numbers that have 2 as a factor are even.
12. All obtuse angles have measure greater than 90.
13. Good weather makes a picnic enjoyable.
14. Two skew lines do not lie in the same plane.

Example 3  
(page 81)

Show that each conditional is false by finding a counterexample.

15. If it is not a weekday, then it is Saturday.
16. Odd integers less than 10 are prime.
17. If you live in a country that borders the United States, then you live in Canada.
18. If you play a sport with a ball and a bat, then you play baseball.

Example 4  
(page 81)

Draw a Venn diagram to illustrate each statement.

19. If you live in New England, then you live in the United States.
20. If you play the flute, then you are a musician.
21. If an angle has measure 40, then it is acute.
22. Carrots are vegetables.

Example 5  
(page 81)

Write the converse of each conditional statement.

23. If you eat your vegetables, then you grow.
24. If a triangle is a right triangle, then it has a  $90^\circ$  angle.
25. If two segments are congruent, then they have the same length.
26. If you do not work, you do not get paid.

Examples 6 and 7  
(page 82)

Write the converse of each conditional statement. Determine the truth values of the original conditional and its converse.

27. If you travel from the United States to Kenya, then you have a passport.
28. **Coordinate Geometry** If a point is in the first quadrant, then its coordinates are positive.
29. **Chemistry** If a substance is water, then its chemical formula is  $H_2O$ .
30. **Probability** If the probability that an event will occur is 1, then the event is certain to occur.
31. If you are in Indiana, then you are in Indianapolis.
32. If two angles have measure 90, then the angles are congruent.

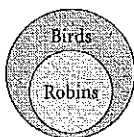
### Apply Your Skills

Write a conditional statement that each Venn diagram illustrates.

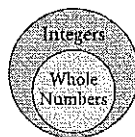
33.



34.



35.



36. **Error Analysis** Ellen claims that both this conditional and its converse are true.  
If  $x$  is an integer divisible by 3, then  $x^2$  is an integer divisible by 3.
  - a. Write the converse of the conditional.
  - b. Only one of the statements is true. Determine which statement is false and provide a counterexample to support your answer.
37. **Multiple Choice** Which conditional and its converse are both true?
  - (A) If  $x = 1$ , then  $2x = 2$ .
  - (B) If  $x = 3$ , then  $x^2 = 6$ .
  - (C) If  $x = 2$ , then  $x^2 = 4$ .
  - (D) If  $x^2 = 4$ , then  $x = 2$ .