

SEE EXAMPLE 1 Identify the hypothesis and conclusion of each conditional.

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3. If a person is at least 16 years old, then the person can drive a car.
4. A figure is a parallelogram if it is a rectangle.
5. The statement $a - b < a$ implies that b is a positive number.

SEE EXAMPLE 2 Write a conditional statement from each of the following.

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6. Eighteen-year-olds are eligible to vote.

7. $\left(\frac{a}{b}\right)^2 < \frac{a}{b}$ when $0 < a < b$.

If $0 < a < b$, then $\left(\frac{a}{b}\right)^2 < \frac{a}{b}$.

8.



If something is a rotation, then it is a transformation.

SEE EXAMPLE 3 Determine if each conditional is true. If false, give a counterexample.

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9. If three points form the vertices of a triangle, then they lie in the same plane. **T**
10. If $x > y$, then $|x| > |y|$. **F; possible answer: $x = 2$ and $y = -4$**
11. If the season is spring, then the month is March. **F; possible answer: April**

SEE EXAMPLE 4 12. **Travel** Write the converse, inverse, and contrapositive of the following conditional statement. Find the truth value of each.

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If Brielle drives at exactly 30 mi/h, then she travels 10 mi in 20 min.

Answers

6. If a person is 18 years old, then that person is eligible to vote.

12. Converse: If Brielle travels 10 mi in 20 min, then she drives at exactly 30 mi/h; F. Inverse: If Brielle does not drive at exactly 30 mi/h, then she does not travel 10 mi in 20 min; F. Contrapositive: If Brielle does not travel 10 mi in 20 min, then she does not drive at exactly 30 mi/h; T.

Independent Practice

For Exercises	See Example
13–15	1
16–18	2
19–21	3
22–23	4

Extra Practice

Skills Practice p. 56
Application Practice p. 529

PRACTICE AND PROBLEM SOLVING

Identify the hypothesis and conclusion of each conditional.

- If an animal is a tabby, then it is a cat.
- Four angles are formed if two lines intersect.
- If 8 ounces of cereal cost \$2.99, then 16 ounces of cereal cost \$5.98.

Write a conditional statement from each sentence.

- You should monitor the heart rate of a patient who is ill.
If a patient is ill, then you should monitor the patient's heart rate.
- After three strikes, the batter is out.
If the batter makes 3 strikes, then the batter is out.
- Congruent segments have equal measures.
If segs. are \cong , then they have equal measures.

Determine if each conditional is true. If false, give a counterexample.

- If you subtract -2 from -6 , then the result is -4 . **T**
- If two planes intersect, then they intersect in exactly one point. **F; by Postulate 1-1-5, 2 planes intersect in exactly 1 line.**
- If a cat is a bird, then today is Friday. **T**

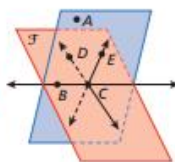
Write the converse, inverse, and contrapositive of each conditional statement.

Find the truth value of each.

- Probability** If the probability of an event is 0.1 , then the event is unlikely to occur.
- Meteorology** If freezing rain is falling, then the air temperature is 32°F or less.
(Hint: The freezing point of water is 32°F)

Find the truth value of each statement.

- E lies in plane \mathcal{R} . **T**
- \overline{CD} lies in plane \mathcal{F} . **T**
- C , E , and D are coplanar. **T**
- Plane \mathcal{F} contains \overline{ED} . **F**
- B and E are collinear. **T**
- \overline{BC} contains \mathcal{F} and \mathcal{R} . **F**



Draw a Venn diagram.

- All integers are rational numbers.
- All rectangles are quadrilaterals.
- All natural numbers are real.
- Plane is an undefined term.

Write a conditional statement from each Venn diagram.

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34. If an animal is a dolphin, then it is a mammal.

35. If a person is a Texan, then the person is an American.

36. If $x < -4$, then $x < -1$.

MULTI-STEP TEST PREP



- This problem will prepare you for the Multi-Step Test Prep on page 102.
 - Identify the hypothesis and conclusion in the Duchess's statement.
 - Rewrite the Duchess's claim as a conditional statement.

"Tut, tut, child!" said the Duchess. "Everything's got a moral, if only you can find it." And she squeezed herself up closer to Alice's side as she spoke.



Teaching Tip

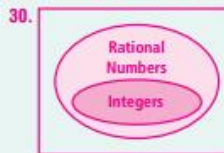
Algebra If students have difficulty with Exercise 10, review the definition of absolute value. If students try only positive numbers for x and y , they may come to the incorrect conclusion that the conditional is true. Remind them to consider all combinations of positive and negative numbers that can be substituted for the variables.

MULTI-STEP TEST PREP

Exercise 37 involves identifying the hypothesis and conclusion in an implied conditional statement. This exercise prepares students for the Multi-Step Test Prep on page 102.

Answers

- Converse: If an event is unlikely to occur, then the probability of the event is 0.1 ; F. Inverse: If the probability of an event is not 0.1 , then the event is likely to occur; F. Contrapositive: If an event is likely to occur, then the probability of the event is not 0.1 ; T.
- Converse: If the air temperature is 32°F or less, then freezing rain is falling; F. Inverse: If freezing rain is not falling, then the air temperature is greater than 32°F ; F. Contrapositive: If the air temperature is greater than 32°F , then freezing rain is not falling; T.



2-2 PRACTICE A

2-2 PRACTICE C

2-2 PRACTICE B

