

1-3 Conditional Statements

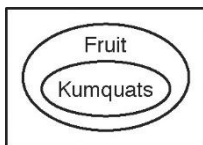
Identify the hypothesis and conclusion of each conditional.

- | | |
|--|---|
| 1. If you can see the stars, then it is night. | 2. A pencil writes well if it is sharp. |
| Hypothesis: _____ | Hypothesis: _____ |
| Conclusion: _____ | Conclusion: _____ |

Write a conditional statement from each of the following.

3. Three noncollinear points determine a plane.

4.



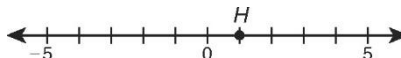
Determine if each conditional is true. If false, give a counterexample.

5. If two points are noncollinear, then a right triangle contains one obtuse angle.

6. If a liquid is water, then it is composed of hydrogen and oxygen.

7. If a living thing is green, then it is a plant.

8. "If G is at 4, then GH is 3." Write the converse, inverse, and contrapositive of this statement. Find the truth value of each.

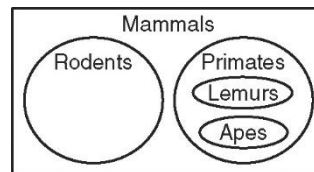


Converse: _____

Inverse: _____

Contrapositive: _____

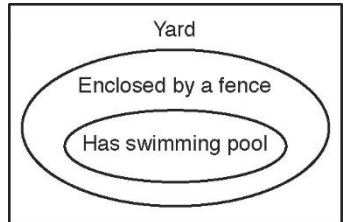
This chart shows a small part of the *Mammalia* class of animals, the mammals. Write a conditional to describe the relationship between each given pair.



9. primates and mammals _____
10. lemurs and rodents _____
11. rodents and apes _____
12. apes and mammals _____

13. Write the converse, inverse, and contrapositive of the conditional statement.
 Find the truth value of each.
If it is April, then there are 30 days in the month.

14. Write a conditional statement from the diagram. Then write the converse, inverse, and contrapositive. Find the truth value of each.



Use the table and the statements listed. Write each conditional and find its truth value.

p : 1777 q : 30 stars r : after 1818 s : less than 50 stars

U.S. Flag	
Year	Number of Stars
1777	13
1818	20
1848	30
1959	50

15. $p \rightarrow q$ _____

16. $r \rightarrow s$ _____

17. $q \rightarrow s$ _____

Choose the best answer.

18. What is the converse of "If you saw the movie, then you know how it ends"?
- A If you know how the movie ends, then you saw the movie.
 - B If you did not see the movie, then you do not know how it ends.
 - C If you do not know how the movie ends, then you did not see the movie.
 - D If you do not know how the movie ends, then you saw the movie.
19. What is the inverse of "If you received a text message, then you have a cell phone"?
- F If you have a cell phone, then you received a text message.
 - G If you do not have a cell phone, then you did not receive a text message.
 - H If you did not receive a text message, then you do not have a cell phone.
 - J If you received a text message, then you do not have a cell phone.

SOLUTIONS:

1. Hypothesis: You can see the stars.
Conclusion: It is night.
2. Hypothesis: A pencil is sharp.
Conclusion: The pencil writes well.
3. If three points are noncollinear, then they determine a plane.
4. If a food is a kumquat, then it is a fruit.
5. true
6. true
7. false; sample answer: a frog
8. Converse: If GH is 3, then G is at 4; false
Inverse: If G is not at 4, then GH is not 3; false
Contrapositive: If GH is not 3, then G is not at 4; true
9. If an animal is a primate, then it is a mammal.
10. Sample answer: If an animal is a lemur, then it is not a rodent.
11. Sample answer: If an animal is a rodent, then it is not an ape.
12. If an animal is an ape, then it is a mammal.

13. Conv.: If there are 30 days in the month, then it is April; false. Inv.: If it is not April, then there are not 30 days in the month; false. Contra.: If there are not 30 days in the month, then it is not April; true.
14. Cond.: If a yard has a swimming pool, then the yard is enclosed by a fence. Conv.: If a yard is enclosed by a fence, then it has a swimming pool; false. Inv.: If a yard does not have a swimming pool, then it is not enclosed by a fence; false. Contra.: If a yard is not enclosed by a fence, then it does not have a swimming pool; true.
15. If the year is 1777, then the U.S. flag has 30 stars; false.
16. If it is after 1818, then the U.S. flag has less than 50 stars; false.
17. If the U.S. flag has 30 stars, then it is after 1818; true.
18. A
19. H