

2.1.D2 – Foundations for Proof

1. Does each conclusion use inductive or deductive reasoning?
 - a. A detective learns that his main suspect was out of town the day of the crime. He concludes that the suspect is innocent.
 - b. All of the students in Henry's Geometry class are sophomores. Alexa takes Geometry, but has another teacher. Henry concludes that Alexa is also a sophomore.

2. Identify the specific information, the general information, and the conclusion for the problem situation.

Mario watched three parades this summer. Each parade had a fire truck lead the parade. He concluded "A fire truck always leads a parade."

- a. Specific information:

- b. General information:

- c. Conclusion:

3. Determine whether inductive reasoning or deductive reasoning is used in the problem situation. Then determine whether the conclusion is correct AND explain your reasoning.

Miriam has been told that lightning never strikes twice in the same place. During a lightning storm, she sees a tree struck by lightning and goes to stand next to it, convinced that it is the safest place to be.

4. In the problem situation, identify whether each person is using inductive or deductive reasoning. Then compare and contrast the two types of reasoning.

When Madison babysat for the Johnsons for the first time, she was there two hours and was paid \$30. The next time she was there for five hours and was paid \$75. She decided that the Johnsons were paying her \$15 per hour. The third time she went, she stayed for four hours. She tells her friend Jennifer that she makes \$15 per hour babysitting. So, Jennifer predicted that Madison made \$60 for her four hour babysitting job.

5. Write each statement in propositional form.

- a. *You will be late to school if you miss the bus.*
- b. *I will go to the game if I get all of my homework done.*
- c. *A student on the high honor roll has at least a 90% average.*

6. Draw a conclusion from the given information.

If a team wins 10 games, then they play in the finals. If a team plays in the finals, then they travel to Boston. The Ravens won 10 games.

7. Find a counterexample for each statement.

- a. *All birds can fly.*
- b. *All bears are brown.*

8. Identify the hypothesis and conclusion of each conditional statement.

- a. *If two lines intersect at right angles, then the lines are perpendicular.*
- b. *If two lines are located in the same plane, then the lines are coplanar lines.*

9. A conditional statement has a truth value of either true or false. Consider the conditional, “*If I get paid, then I will take you to the movie.*”

- a. If the hypothesis is true and the conclusion is false, what does this mean?
- b. If p is true and q is false, what is the truth value of a conditional statement?

10. Determine if the conditional statement is true. If it's false, give a counterexample.

If an angle is obtuse, then it has a measure of 100° .

11. If a conditional statement is false, what are the truth values of its hypothesis and conclusion?

12. What is the truth value of a conditional statement whose hypothesis is false?