

LESSON
2.1

Practice B

Using Inductive Reasoning to Make Conjectures

Find the next item in each pattern.

1. 100, 81, 64, 49, . . .

2.  . . .

3. Alabama, Alaska, Arizona, . . .

4. west, south, east, . . .

Complete each conjecture.

5. The square of any negative number is _____.

6. The number of segments determined by n points is _____.

Show that each conjecture is false by finding a counterexample.

7. For any integer n , $n^3 > 0$.

8. Each angle in a right triangle has a different measure.

9. For many years in the United States, each bank printed its own currency. The variety of different bills led to widespread counterfeiting. By the time of the Civil War, a significant fraction of the currency in circulation was counterfeit. If one Civil War soldier had 48 bills, 16 of which were counterfeit, and another soldier had 39 bills, 13 of which were counterfeit, make a conjecture about what fraction of bills were counterfeit at the time of the Civil War.

Make a conjecture about each pattern. Write the next two items.

10. 1, 2, 2, 4, 8, 32, . . .

11.  . . .

Identify each as either A: inductive or B: deductive reasoning.

1. You take 3 things and add them to 5 more things and count that you have 8 things. You repeat this several times and conclude that $3+5=8$.
3. You know that your ipod battery is low. It suddenly shuts off. You conclude that your ipod battery must have died.
5. Using specific examples to reach a general conclusion.
7. You know that if lines are parallel then alternate interior angles are equal. Your lines are parallel so you conclude that your alternate interior angles are equal.
9. The pen you had in your backpack is missing. You see your friend using a pen that looks like it. You conclude that your friend stole your pen, and you will be mad at him until lunch.
11. The sum of two sides of a triangle add up to be greater than the third side. You conclude that the triangle does in fact exist.
13. The area of a parallelogram is bh . The base is 12 and the area is 24. You conclude that the height is 2.
15. You go fishing, and every time you fish in a certain hole you never catch anything. You conclude that there are no fish in that hole.
17. Every time you eat fast food your stomach feels funny. You conclude that fast food makes your stomach feel funny.
2. You know that between two points there is exactly one line. You have two points, so you conclude you must have one line between them.
4. Using postulates theorems and definitions to draw conclusions.
6. Whenever you forget to feed your goldfish it dies. You conclude that if you don't feed your fish it will die.
8. You add up the interior angles of a bunch of quadrilaterals and get 360° every time. You conclude that the sum of the interior angles of all quadrilaterals is 360° .
10. The sum of the squares of the sides of a triangle is equal to the square of the third side. You conclude that the triangle must be a right triangle.
12. Every time you do all your homework your grades improve. You conclude that doing homework improves your grades.
14. You notice that every time you draw a triangle with the same 3 side lengths 5cm, 6cm, and 7cm, the triangles are congruent. You conclude that all triangles with the same 3 side lengths are congruent.
16. You know that an isosceles triangle has two equal sides. You see a triangle that has two equal sides and conclude that it is isosceles.
18. You see a series of numbers, 1, 3, 5, 7, ... You conclude the next number is a 9.