Find a pattern for each sequence. Use the pattern to show the next two terms.
1. 5, 11, 18, 26, …
2. A, B, D, E, G, H, …
3. –3, 6, –12, 24, –48, …
4. 1, 5, 30, 210, 1680, …
5. 

Use the sequence and inductive reasoning to make a conjecture.

Sequence A:

6. How many sides does the fifth figure of Sequence A have?
7. How many sides does the tenth figure of Sequence A have?
8. How many sides does the fourteenth figure of Sequence A have?

Sequence B: –5, 4, –2, –5, 4, –2, –5, 4, –2, …

9. What is the tenth term of Sequence B?
10. What is the fifteenth term of Sequence B?

Make a conjecture for each scenario by giving three examples. Then prove your conjecture algebraically.

11. the square of an odd number

12. the product of two even numbers and an odd number

Consider the sequence: 1, 9, 25, 49, …

13. Describe a pattern in this sequence of numbers and predict the next three numbers.

14. If any of these numbers is divided by 4, what is the remainder?
15. Based on your answer to #14, write a conjecture.

16. Use algebra to show why your conjecture is true.

**Use inductive reasoning to make a prediction for each scenario.**

17. A farmer keeps track of the water his livestock uses each month. Predict the amount of water used in August. Is it reasonable to use the graph to predict water consumption for October? Explain.

[Graph: Livestock Water Use by Month]

18. Hannah sells snow cones during soccer tournaments. She records data for snow cone sales and temperature. Predict the number of snow cone sales when the temperature is 100° F. Is it reasonable to use the graph to predict sales when the temperature is 15° F? Explain.

[Graph: Snow Cone Sales]

**Find one counterexample to show that each conjecture is false.**

19. The sum of two integers is always positive.

20. The product of two mixed numbers is never a whole number.

21. All four-sided figures are rectangles.