Solving Problems by Inductive Reasoning
Contemporary Math (MAT-130)

Identify the reasoning process, inductive or deductive.

1. I got up at nine o'clock for the past week. I will get up at nine o'clock tomorrow.
2. James Cameron's last three movies were successful. His next movie will be successful.
3. Jim has 20 pencils. He gives half of them to Dan. Jim has 10 pencils left.
4. Every even number is divisible by two. 1986 is an even number. It is divisible by two.
5. In the sequence 1, 2, 4, 7, 11, 16 the next most probable number is 22.
6. Everyone who studies does well. Samantha studies. She will do well.
7. The garbage truck comes every other Tuesday. It did not come last Tuesday. It will come this Tuesday.
8. Any number multiplied by one equals that number.
9. Gas prices have gone down every day this week. The price of gas will go down tomorrow.
10. Every flavor Snapple has made tastes good. The next flavor Snapple makes will taste good.
11. All street legal cars have blinkers. My car is street legal. It has blinkers.
12. Every President of the United States has been male. The next two Presidents of the United States will be men.
13. The World Cup is held every four years. The last time it was held was in 2006. The next World Cup will be in 2010.
14. What goes up must come down. It went up. It will come down.
15. The Sun has risen in the east every day of Tim's life. It will rise in the east tomorrow.

Determine the most probable next term in the sequence.

16. 4, 8, 12, 16, 20
17. 1, 2, 4, 8, 16
18. a, b, c, d
19. 1, 4, 9, 16, 25
20. 1, 3, 9, 27
21. 1, 2, 11, 2, 111, 2, 1111, 2
22. 1, 4, 3, 6, 5, 8
23. 0, 1, 1, 2, 3, 5, 8, 13
24. 2, -4, 6, -8, 10
25. 2, 4, 3, 6, 5, 10, 9, 18, 17

Predict the next equation in the list

26. $1 = 1^2$

    $1 + 3 = 2^2$

    $1 + 3 + 5 = 3^2$

27. $1 - 2 = -1$

    $1 - 2 + 3 - 4 = -2$

    $1 - 2 + 3 - 4 + 5 - 6 = -3$

28. $\frac{1}{2} = 1 - \frac{1}{2}$

    $\frac{1}{2} + \frac{1}{4} = 1 - \frac{1}{4}$

    $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} = 1 - \frac{1}{8}$

Use the method of Gauss to find the following sums

29. $1 + 2 + 3 + \cdots + 50$
30. $1 + 2 + 3 + \cdots + 500$
31. $2 + 4 + 6 + \cdots + 100$

Solutions:

1. Inductive
2. Inductive
3. Deductive
4. Deductive
5. Inductive
6. Deductive
7. Deductive
8. Deductive
9. Inductive
10. Inductive
11. Deductive
12. Inductive
13. Deductive
14. Deductive
15. Inductive
16. 24
17. 32
18. e
19. 36
20. 81
21. 11111
22. 7
23. 21
24. -12
25. 34
26. $1 + 3 + 5 + 7 = 4^2$
27. $1 - 2 + 3 - 4 + 5 - 6 + 7 - 8 = -4$
28. $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} = 1 - \frac{1}{16}$
29. $25 * 51 = 1275$
30. $250 * 501 = 125250$
31. $25 * 102 = 2550$