Use mathematical induction to prove the following statements true for every positive integer n.

7. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$

8. $\sum_{i=1}^{n} 2i = n^2 + n$

9. $\sum_{i=1}^{n} (2i - 1) = n^2$

10. $\sum_{k=1}^{n} (1 + 2k) = n^2 + 2n$

11. $\sum_{k=1}^{n} (5 + 4k) = 2n^2 + 7n$

12. $\sum_{k=1}^{n} [a + (k - 1)d] = \frac{n}{2}[2a + (n - 1)d]$

13. $\sum_{i=1}^{n} 2^{i-1} = 2^n - 1$

14. $\sum_{i=1}^{n} (\frac{1}{2})^i = 1 - (\frac{1}{2})^n$

15. $\sum_{k=1}^{n} a \cdot r^{k-1} = \frac{a(r^n - 1)}{r - 1}, r \neq 1$

16. $\sum_{i=1}^{n} i^2 = \frac{1}{6}n(n + 1)(2n + 1)$

17. $\sum_{k=1}^{n} k(k + 1) = \frac{n(n + 1)(n + 2)}{3}$

18. $n^2 + 5n$ is an even positive integer.

19. $\frac{1}{2}(n + 2)(n + 1)$ is a positive integer.

20. $\frac{1}{3}(n^3 - n + 3)$ is a positive integer.

21. $\frac{1}{5}(9^n - 4^n)$ is a positive integer.

22. If $0 < a < b$, then $a^n < b^n$.

23. The square of every odd integer greater than 1 can be written in the form $4p + 1$, where p is a positive integer.

24. $i^n \in \{i, -1, -i, 1\}$ for any integer n. (*Hint:* Use mathematical induction to prove the statement for any natural number n and go on from there.)