1. \( 1 + 2 + \cdots + n = \)

2. \( 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots = \)

3. For \(|\lambda| < 1\), \(\sum_{n=0}^{\infty} \lambda^n = \)

4. \( \int_1^4 x^2 \, dx = \)

5. \( \frac{d}{dx} (x \log x) = \)

6. \( \frac{d}{dx} \sin(x^2) = \)

7. Sketch the graph of the function \( f(x) = xe^{-x} \) for \( x > 0 \) and find its maximum value.

8. Sketch the graph of the function \( f(x) = x^2 + 4x + 3 \) for \( -\infty < x < \infty \), find its minimum value, and find the roots of the equation \( f(x) = 0 \).

9. \( \int_0^1 \int_0^1 x \, dx \, dy = \)

10. Let \( T \) be the triangle with vertices (0,0), (1,0), and (1,1) in the \( x-y \) plane. Then \( \int \int_T x \, dx \, dy = \)

11. How many distinct unordered subsets can be formed from \( \{1, 2, \ldots, n\} \)? (Include the empty set.)

12. In how many distinct ways can the integers 1, \ldots, \( n \) be arranged? (i.e., how many permutations?)