

7. $\left(1 - \frac{2}{3}\right)^n = 2^n \left(1 - \frac{1}{3}\right)^n$. 12. $\frac{2n}{1^n - n}$.
14. Deduced from $(1 - x^3) = (1 - x)^3 = 3x - 3x^2$. 16. (1) 45. (2) 6561.
18. (1) Equate coefficients of x^r in $(1+x)^n(1+x)^{-1} = (1+x)^{n-1}$.
 (2) Equate absolute terms in $(1+x)^n \left(1 + \frac{1}{x}\right)^{-2} = x^2(1+x)^{n-2}$.
20. Series on the left $+ (-1)^n q_n^2 =$ coefficient of x^{2n} in $(1-x^2)^{-\frac{1}{2}}$.
21. $2^{2n-1} = \frac{1}{2} \cdot \frac{|2n|}{|n|}$.
 [Use $(c_0 + c_1 + c_2 + \dots + c_n)^2 = 2(c_0c_1 + c_1c_2 + \dots) = c_0^2 + c_1^2 + c_2^2 + \dots + c_n^2$].

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1. 12600. 2. 168. 3. 3360. 4. $-1260a^2b^3c^4$.
5. -9. 6. 8085. 7. 30. 8. 1905.
9. 10. 10. $\frac{3}{2}$. 11. 1. 12. $-\frac{4}{81}$.
13. $\frac{59}{16}$. 14. -1. 15. $\frac{241}{3}$. 16. $1 - \frac{1}{2}x + \frac{7}{8}x^2$.
17. $1 - 2x^2 + 4x^3 + 5x^4 - 20x^5$. 18. $16 \left(1 - \frac{3}{2}x^3 + 3x^4 + \frac{9}{32}x^5 - \frac{9}{8}x^7 + \frac{9}{8}x^8\right)$.

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1. 8, 6. 2. 2, -1. 3. $\frac{16}{3}, \frac{1}{2}$. 4. 4, $\frac{3}{2}$.
5. $\frac{4}{3}, \frac{1}{5}$. 6. $\frac{2}{5}, -\frac{1}{2}, -\frac{5}{2}$. 7. $\frac{7}{3}, 3, \frac{1}{3}, \frac{2}{3}$.
8. $6 \log a + 9 \log b$. 9. $\frac{2}{3} \log a + \frac{3}{2} \log b$.
10. $-\frac{4}{9} \log a + \frac{1}{3} \log b$. 11. $\frac{2}{3} \log a - \frac{1}{2} \log b$.
12. $\frac{7}{12} \log a - \log b$. 13. $\frac{1}{2} \log a$. 14. $-5 \log c$. 16. $\log 3$.
18. $\frac{\log c}{\log a - \log b}$. 19. $\frac{5 \log c}{2 \log a + 3 \log b}$.
20. $\frac{\log a + \log b}{2 \log c - \log a + \log b}$. 21. $x = \frac{4 \log m}{\log a}, y = -\frac{\log m}{\log b}$.
22. $\log x = \frac{1}{5}(a + 3b), \log y = \frac{1}{5}(a - 2b)$. 24. $\frac{\log(a-b)}{\log(a+b)}$.